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Rolling Steel DOORS



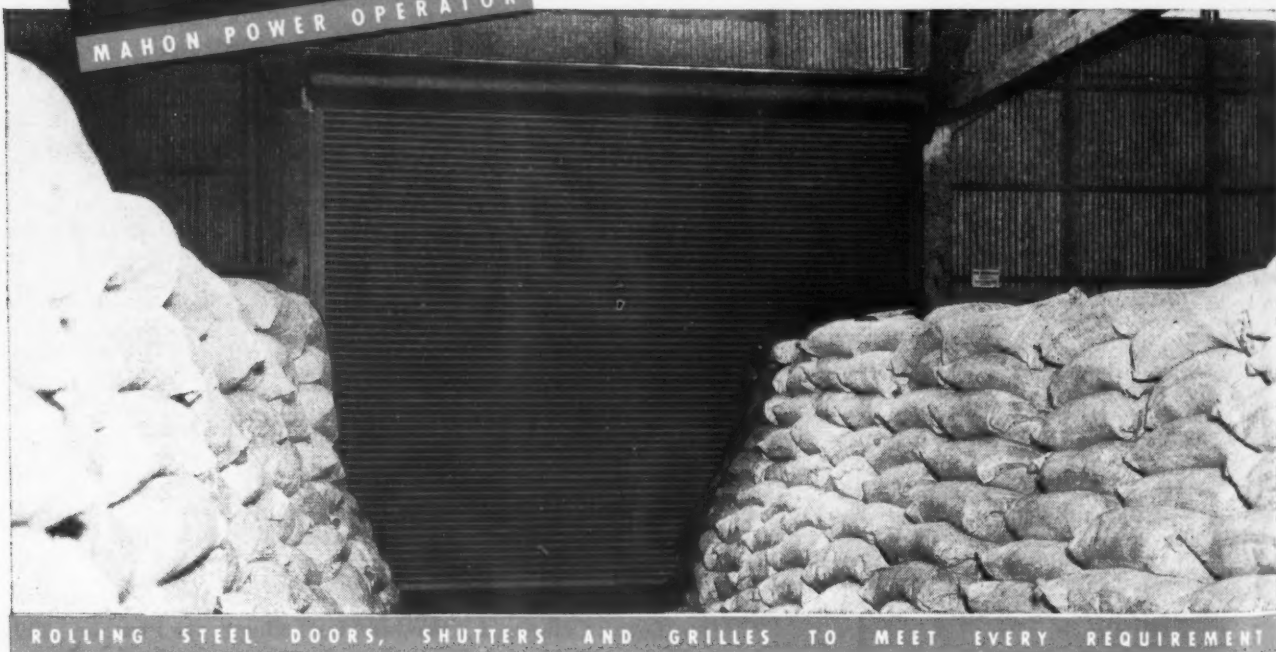
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Penny Wise, Pound Foolish

PERHAPS the eye has been a little too preoccupied by labor-management's war of nerves. What with the surge of realistic collective bargaining agreements over the past week, there is now some opportunity to shift attention to less dramatic areas of the industrial arena—as, for instance, the clarion call of *Life* magazine for lower steel prices. This was followed three weeks later by Harold Ruttenberg's interesting dictum that industrial health at home and rehabilitation abroad hinge upon an expanding steel capacity stimulated by guaranteed higher profits through raising prices at least an additional 1c per lb.

To the casual reader, the additional cent per pound for steel might appear rather modest. But Mr. Ruttenberg is talking real money—somewhere between 50 to 200 pct rise for raw steel. If the industry could be assured of such an advance coupled with the capacity operations Mr. Ruttenberg promises, a delirious wave of happiness would spread from Sparrows Point to Fontana. New blast furnaces would spring from the land overnight.

Mr. Ruttenberg for ten years established an enviable reputation as research director of United Steelworkers of America, C.I.O., a short time ago resigning to become vice-president of Portsmouth Steel Corp. By curious coincidence his plea for higher prices as the key to growth appears next to *Life's* pictorial record of Mr. Henry Ford's life and death. Here then the wheel of economics has made its full cycle. The ex-C.I.O. stalwart, turned industrialist, preaches the outmoded economic doctrine of high prices and protected profits as the props for productive expansion. Next to him is Henry Ford, the C.I.O.-hater, the economic empire builder, whose passionate conviction was that consumption is the sole object of all economic activity, that lowest possible cost is the key to wealth for the consumer.

Perhaps Mr. Ruttenberg dashed his thesis off in excessive haste. It appears exceedingly uneven in some spots, and elsewhere there are some rather nasty gaps that require a good deal of fill before the highway into the future approaches the smoothness he pictures.

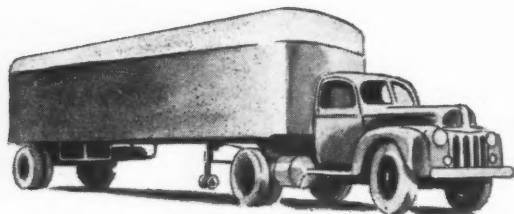
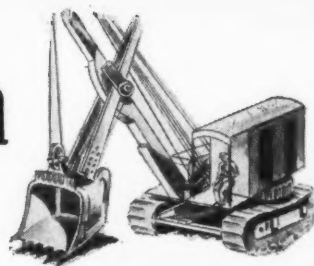
There's no reason why Mr. Ruttenberg, or anyone else, can't tack another penny onto the price of steel: that is, no other reason than the uneasy conviction that some competitor may get order-hungry enough to sell for less. Or, perhaps Mr. Ruttenberg is implying government support of higher prices, something on the order of parity for farm products. That's nothing more than the age-old robbing of the taxpayer Peter to pay the industrial Paul, which poses a whole bag-full of threats to the traditional free enterprise system. World starvation for steel also seems to fascinate Mr. Ruttenberg. Steel prices pegged 50 to 200 pct higher is a curious way to alleviate that starvation in view of the world's inability to scrape up dollar exchange for the dribble of steel currently being exported.

The insistence that the world's needs must be satisfied along with peak domestic requirements has merit on moral and political grounds, but poses a whole series of tantalizing questions as to who will pay for what, and how. After all, the American taxpayer is beginning to pull a little at the seams.

Mr. Ruttenberg rather disparagingly points up the fact that steel is not even a 5c commodity, whereas a good cigar (or even a bad one) is not to be had today for a nickel. The comparison is unfortunate. For some twenty years cigar consumption has persistently declined as prices were pushed above the 5c level.

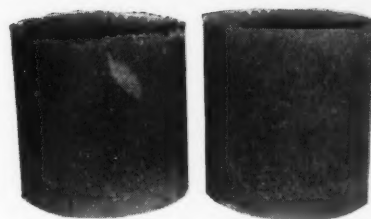
T. W. Lippert

increase strength



reduce weight

resist corrosion



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► A new glass has been developed for automobile windshields and industrial use. It has a slight conductivity which permits a charge to be passed through it, warming it enough to melt sleet and ice as they form on the outer surface.

► Steelmakers are looking at first quarter financial figures with fingers crossed. They have already begun to worry about the coming buyers' market. Guessing has already started as to who will cut prices first when the dreaded day comes. Some don't think it will come until the first quarter of 1948.

► Because of wider and heavier bumpers, some of which bend around the fenders, it is estimated that today's automobiles are about 500 lb. heavier than prewar models.

► Electric motor manufacturers are gradually trimming down their backlogs. Fractional horsepower motors quoted for 30- to 36-month delivery last year are now on a 23-month delivery basis. On 1- to 15-hp 3-phase motors delivery time is 60 weeks, except for emergency service, where delivery time is shorter.

► A new type of centerless grinding rest uses sintered carbides on the wearing surface. Slots are milled into the head, with carbide blocks brazed in place and separated by two steel shims. The latter are also brazed into place and are part of the wearing surface. Tests show the new rest lasts five to 10 times as long as the ordinary types.

► Latest synthetic tires hold air so well they are said to be able to go as long as 5 months without adding air. The new synthetics are also reported to be more resistant to tearing.

► Within the past year at least six companies have begun making aluminum electrical wire for use in building construction. The supply position of aluminum wire—as well as rods and bars—is excellent.

► Machine tool controls of a mechanical nature are getting easier to obtain. Producers are selling some standard types off the shelf. Delivery on controls runs from 20 to 60 weeks, depending on the engineering involved.

► The 1947 machine tool show will be the biggest industrial affair the country has ever seen. It will occupy 513,000 sq ft of floor space—or about 12 acres—in the former Dodge Chicago war plant, future home of the Tucker Torpedo.

► A "hot-cold pipe" 15 in. long and 1 in. in diam converts ordinary compressed air into both hot and cold air without using any moving parts. Low efficiency rules out commercial application at this time but its possibilities are being carefully studied by Westinghouse researchers.

► Fighting corrosion is a major occupation of automobile metallurgists these days. Where rusting is a serious problem some producers are using 30 pct heavier gage steel than in prewar cars. In addition, special spray guns have been developed to reach hidden interior surfaces.

On an average, the auto industry is using 50 pct heavier chrome plating than prewar. Some companies have doubled and even tripled chrome plate thickness to improve protection.

► American exports to South Africa are currently running at thrice their prewar value, while British sales to the thriving country have doubled.

► An improved chemical coating that deepens the color of a blueprint and increases legibility is now available. It is a silica aquasol solid marketed as Mertone WB-2 by Monsanto and used as a precoat on a paper subsequently coated with light-sensitive blueprint solutions.

► Publication by The Iron Age of the details of steel industry studies underway in the Dept. of Commerce and Federal Trade Commission has stirred up a hornet's nest of charges and counter charges involving duplication of work by government bureaus. There is particular concern over the entrance of FTC, a semi-judicial body, into the field of broad economic studies. It is reported that this issue may be taken to the White House for settlement.

► Wags are saying that WAA's next big Chicago chemical surplus sale will be dynamite: the agency will offer more than a million pounds of TNT.

How the Ford Rouge Foundry Handles

Hot Metal

Delivery of as much as 70 tons of hot metal per hour to four continuously moving lines of automobile cylinder block molds at the Ford River Rouge plant involves a number of unusual arrangements for melting and hot metal holding. This article describes in detail the flow of the molten metal from the blast furnace and cupola, through the mixers, electric and air furnaces to the mold to provide a continuous supply of metal, closely controlled as to composition and temperature, for pouring up to 6000 blocks in 16 hours.

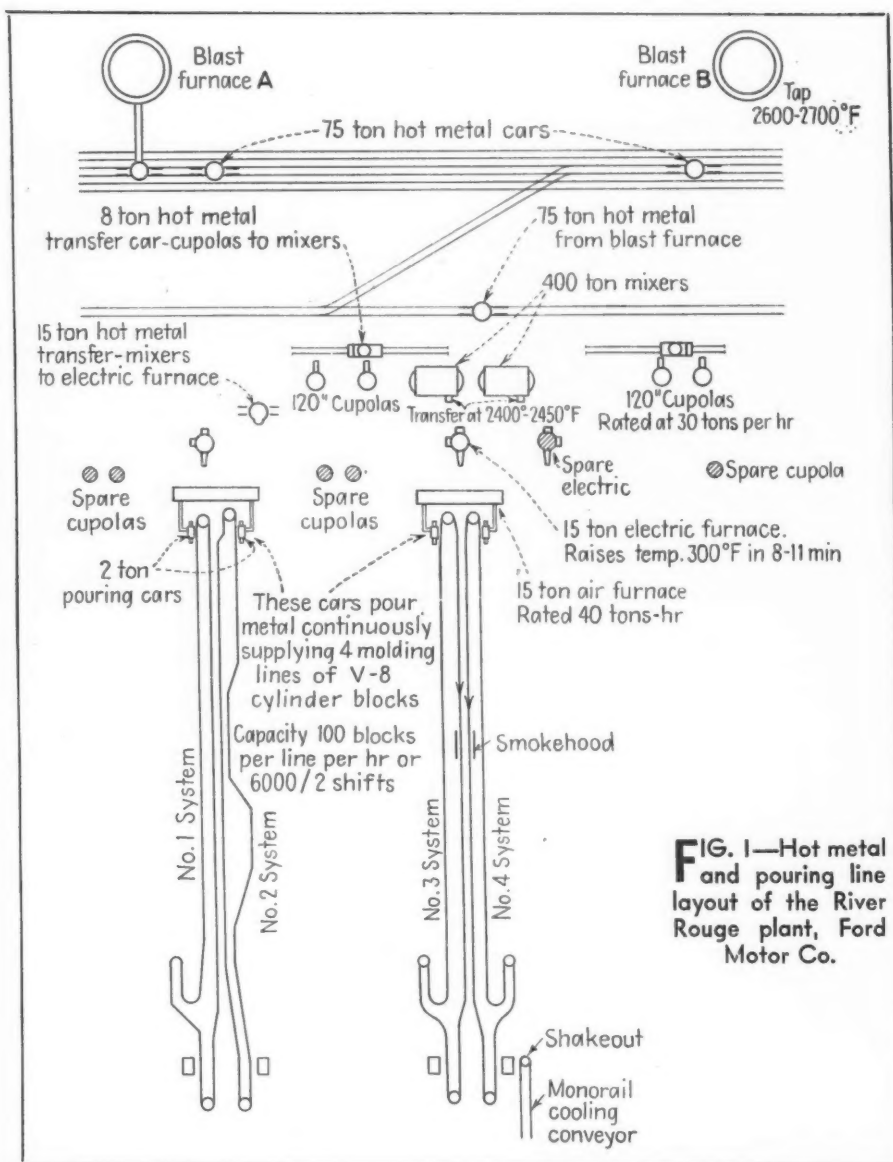


FIG. 1—Hot metal and pouring line layout of the River Rouge plant, Ford Motor Co.

A NUMBER of years ago Ford metallurgists and engineers concluded that continuous pouring offered the only possibility of delivering as much as 70 tons of hot metal per hour to four moving lines of cylinder block molds. The fact that the metal had to be closely controlled as to composition and pouring temperature added weight to the argument that continuous pouring offered the best practical solution to the Ford problem.

In addition to excellent control of product quality, Ford engineers and metallurgists believed that a system of continuous pouring of cylinder blocks could be set up which would increase the average tonnage of hot metal it was possible to handle from the melting units to the pouring station on the cylinder block lines and thereby increase the average number of cylinder blocks cast. Ladle pullers and ladle repairs, with their substantial amount of labor, would be eliminated, and large losses of metal due to pigging in the event of molding line delays would also be avoided.

With the necessity in mind of meeting the conditions mentioned above, the Ford Motor Co. has adopted the foundry layout and practices described in this article. Fig. 1 is a flow plan for cylinder blocks, including many modifications of the original layout which have been dictated by

al for Continuous Pouring

By W. G. PATTON
Detroit Regional Editor

technical progress and changes in economic conditions.

It has been estimated that 7 million engine blocks have already been poured using the practice described in this article. Since its inception, important changes and adjustments have been made in the process, especially those changes relating to operation and maintenance of equipment. Many possible variations of the present practice have been carefully examined, including the possibility of eliminating the use of electric furnaces. It is significant, however, that no basic changes have been made in the practice since the continuous pouring method was first adopted.

Essentially, the Ford process combines the use of hot metal from the blast furnace and from a group of four 120 in. cupolas, carrying this hot metal to either one of two 400-ton mixers (fig. 2) and transferring the iron at 2400° to 2450°F to electric furnaces where the temperature of the metal is raised approximately 300°F. The metal is then poured into either of two air furnaces (see fig. 3) that act like a huge continuous ladle as they receive the metal and discharge it through troughs to specially designed pouring cars (fig. 4) which pour an average of 200 moving molds per hour without the usual backing and filling that is required where ladle pouring is used. Each holding furnace supplies two molding lines with production of 100 castings per hour from each line.

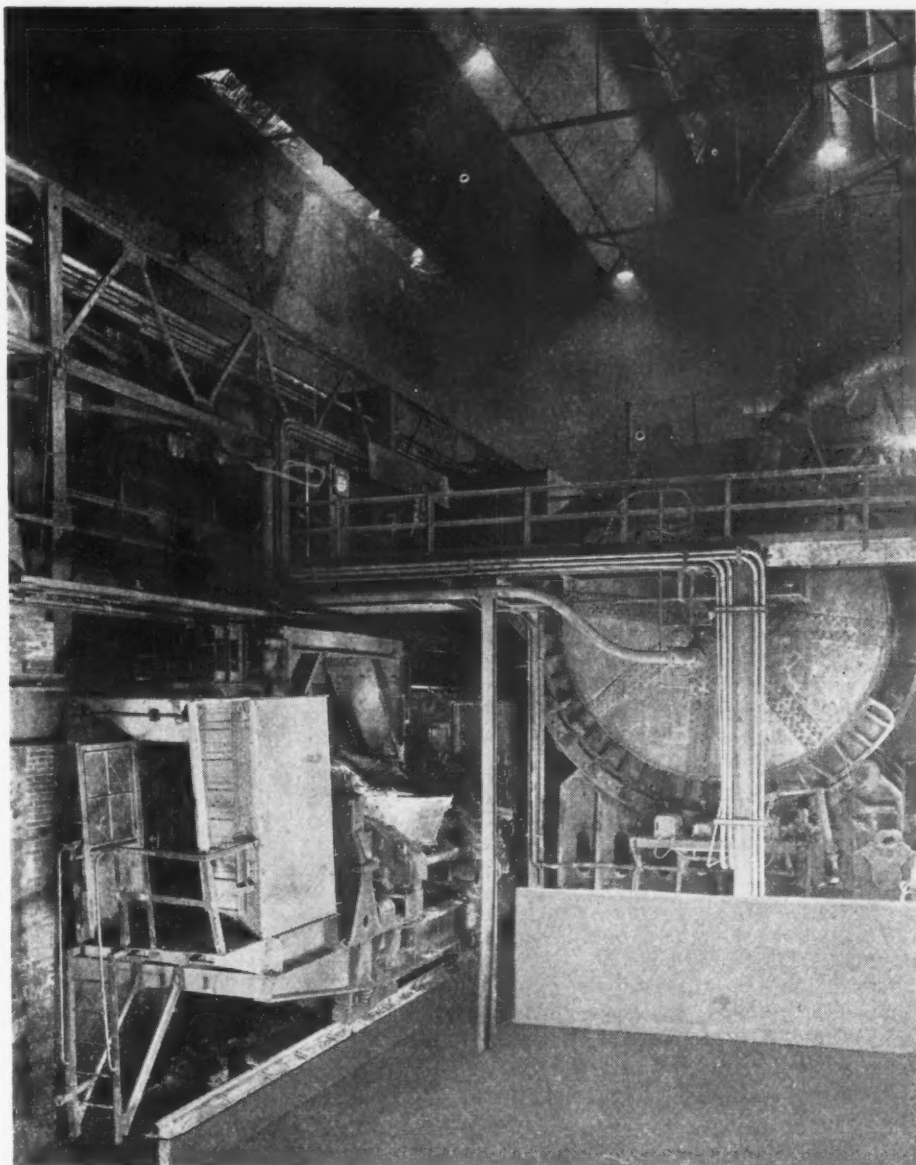
The entire operation can be followed in the layout shown in fig. 1 which gives the sequence of operations and types and capacity of equipment used.

The overall effect of this layout automatically results in the production of more high quality cylinder blocks at a lower cost than would be possible with the usual foundry practice. The present Ford

operation calls for the continuous pouring of more than 6000 cylinder blocks in 16 hr.

Ford hot metal is supplied 40 pct from one of two blast furnaces and 60 pct from a battery of four 120 in. diam cupolas; two cupolas are operated at a time. The blast furnaces have a maximum capacity of 900 tons per day each and the usual operating rate is 750 to 800 tons every 24 hr. Metal is tapped

FIG. 2—View of 400-ton mixer which is fed hot metal from cupola and blast furnace. The metal moves from these mixers to electric furnaces.



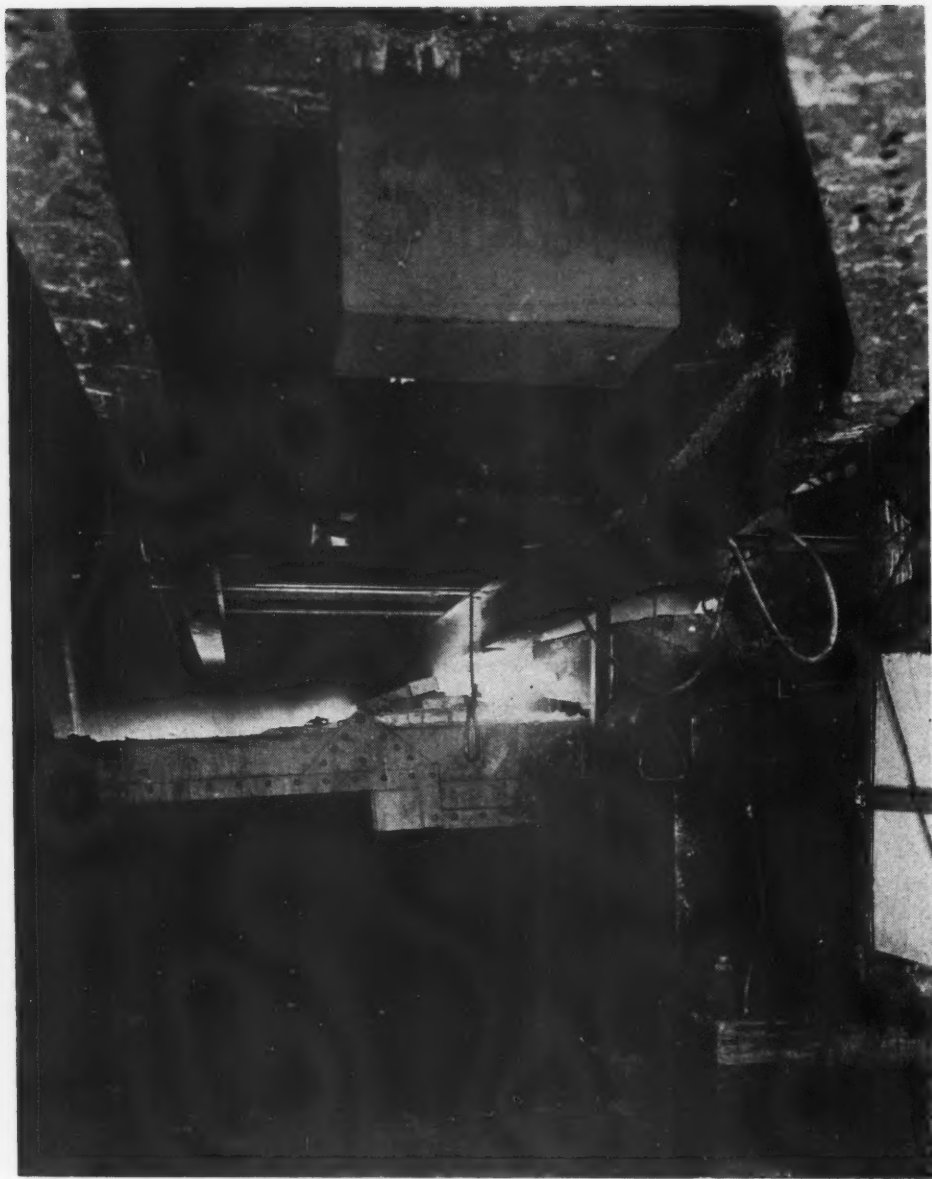


FIG. 3—View of the hot metal transfer runner from the 15-ton electric furnace to the coal fired holding units.

from blast furnaces at 2600° to 2700°F into 75-ton ladles, two to four ladles to a train, for transfer to the openhearth furnaces or foundry as molten metal. Any metal that the openhearth or foundry doesn't require as molten metal is pigged, to be used cold in both foundry and openhearth.

The output of four 120 in. cupolas is available at all times for Ford cylinder blocks. These units, rated at 30 tons per hour, utilize conveyors to fill charging buckets which are then charged into the cupolas by means of 15-ton specially-built charging cranes.

The usual amount of steel scrap charged into the cupola is about 25 pct, but larger percentages can be used if desired. Many adjustments in the scrap charge have been necessary in recent months because of the uncertain conditions prevailing with respect to pig iron and steel scrap.

One advantage of the Ford foundry operation in times such as the present is the fact that the composition of the hot metal can be quickly adjusted by

simply varying the relative amounts of metal taken from blast furnace and cupola.

By using 400-ton holding mixers, it is possible to use blast furnace hot metal and allow for the storing of mixed cupola and blast furnace metal on a 24-hr basis regardless of the fact that pouring of cylinder blocks is only on a 16-hr basis.

Operation of the 400-ton mixers is coordinated to permit continuous pouring of metal during a 16-hr working period. Between 10:30 p.m. and 4 a.m. one mixer is filled, usually 60 pct from the cupola and the remainder from the blast furnace. Metal from this source will be poured from 6:30 a.m. to 2:30 p.m. Meanwhile, the second mixer is being filled and will be used as the source of hot metal from 2:30 until 10:30 p.m.

Before removing the metal from the mixers, samples are taken and carefully analyzed in the laboratory. Normal composition is:

	Percentage
Total carbon ...	3.30—3.45
Silicon	2.10—2.30
Manganese	0.60—0.80
Sulfur	0.08 max
Phosphorus	0.15 max

Mixers are gas fired, utilizing fuel from the coke ovens. Oil firing can be used if necessary as the heat supplied is only to

take care of radiation. Metal is transferred at 2400° to 2450°F for delivery to either of two electric furnaces of the mechanical lift, nose tilt type having 15-ton capacity. In the electric furnaces the temperature of the metal is raised to about 2750°F over a period of 8 to 11 min.

If desired, the composition of the metal can be adjusted and alloys added at this point although this practice is seldom necessary. The principal function of the electric furnaces is to heat to pouring temperatures the mixture of cupola and blast furnace metal from mixers. There is little change in composition. Power consumed by this brief operation is about 90 kw-hr per ton.

In front of the electric furnace is the stationary 25-ton air furnace fired with pulverized coal. At 10 to 15 min intervals, the hot metal is poured into the air furnace from the electric furnace at a rate of approximately 40 tons per hour. This air furnace is essentially a heated reservoir for the operations which follow thereafter. From the time the metal

leaves the electric furnaces until it is poured into the moving molds, there is no interruption to the flow.

This is made possible by the use of a unique moving car-pouring ladle (fig. 4), operated by one man, which is designed and synchronized as to its horizontal and rotary action so that it receives its hot metal continuously from the air furnaces and pours the metal intermittently to the molds as they travel along on the conveyor. Two streams of hot metal, one from each side of the air furnaces, are delivered by two pouring cars to the moving molds.

While the continuous delivery of hot metal to the molding lines is a highly ingenious operation, continuity of service is also highly important. Therefore, additional equipment of a standby nature has been installed such as cupolas, an electric furnace and pouring monorails so that if the regular metal source should be cut off, the molders, coremakers and other foundry employees can continue to work even with a serious breakdown to the regular hot metal system. This protection is particularly necessary today on account of insistent production demands and worker protection against loss of working time.

For the preparation and drying of cores for the cylinder block, Ford is currently spending approximately \$2,900,000 for a new core room. One objective of this program is to introduce more modern methods in coremaking which will in turn improve the casting. A second objective is to provide better working conditions for Ford employees. Other changes already approved in the vast Rouge foundry will bring the cost of the current modernization program to approximately \$12 million.

No basic changes in the present Ford operation are contemplated although, as always, major adjustments will be made as fast as they are proven, par-



FIG. 4—Pouring car which serves the cylinder block line. This view shows the continuous stream of metal from the holding furnace entering the pouring ladle, and a stream from the pouring ladle entering the molds.

ticularly those changes which take advantage of latest technical advancements by the foundry industry.

At the moment, Ford foundry costs are being carefully examined, and it may be expected that the same Ford engineers who were the first in the industry to devise a way to pour hot metal continuously to a moving line of molds will find new possibilities for reducing still further the cost of the company's vast foundry operations.



FINISHING a mold for an aircraft part at the Wright Aeronautical Corp. plant at Wood Ridge, N. J.

AFA Meeting to Stress Newest Foundry Techniques

Detroit to be host to 51st annual convention of American Foundrymen's Association . . . New foundry techniques and practices and improved metallurgical controls will highlight technical discussions . . . MacKenzie to present first Hoyt lecture . . . Advance registrations indicate heavy attendance.

IMPROVED metallurgical controls, new foundry production techniques, and practices, and an industry-wide apprentice and engineering student training program, all phases of the effort to maintain current high levels of casting production in the face of material and personnel shortages, will highlight the 51st annual convention of the American Foundrymen's Association to be held in Detroit from Apr. 28 through May 1.

Technical and general sessions, round tables, and

shop courses scheduled for this year's meeting will cover practically all phases of casting operation, including gray iron, steel, malleable and nonferrous. While there will be no exhibit at this year's convention, advance registrations, according to AFA officials, indicate an attendance of more than 5000 executives and engineers from North and South America and from abroad.

In addition to the usual social activities and the annual banquet, the AFA convention committee has made arrangements to permit visitors to Detroit to visit and inspect a number of automotive and general jobbing foundries in the Detroit area. Among the foundries which will welcome delegates on the plant visitations program are those of the Cadillac and Buick Motor Car divisions and the Saginaw Malleable Iron plant of General Motors Corp.; Packard Motor Car Co.; Wilson Foundry & Machine Co., and American Car & Foundry Co. Friday has been designated "Ford Day"

and will feature a specially conducted tour of the company's Rouge plant and foundry.

A highlight of the annual business meeting on Wednesday will be the presentation of the first Charles Edgar Hoyt Lecture by J. T. MacKenzie, chief metallurgist, American Cast Iron Pipe Co., Birmingham, Ala. Dr. MacKenzie, an outstanding foundry chemist and metallurgist, will speak on "The Cupola Furnace."

The Association's annual meeting will also feature an address by George T. Christopher, president and general manager, Packard Motor Car Co., Detroit, who will speak on "Why the Importance of the Foundry Industry."

Convention sessions have been arranged so that foundrymen attending the convention will be able to attend the maximum number concerning their particular field of interest in the minimum number of days. Aluminum, magnesium and malleable meet-



SHELDON V. WOOD, AFA president, will preside at the association's annual meeting. Mr. Wood is president, Minneapolis Electric Steel Castings Co., Minneapolis.

ings will be held Monday and Tuesday; those on brass and bronze on Tuesday and Wednesday. Steel and gray iron topics will be covered, with one exception in each case, on Wednesday and Thursday.

Foundry mechanization, which will come up for discussion frequently throughout the week, will be highlighted in a Wednesday evening session on design and operation of mechanized foundries, sponsored by the association's plant and plant equipment committee. Foundry costs and job evaluation and time study meetings will be held on Thursday.

Apprentice and foreman training and foundry courses for college graduates will be covered Monday afternoon. A dinner meeting that evening will deal with management's stake in personnel. Shop course sessions on gray iron and sand practices will be held the afternoon and evening of each day of the convention.

Technical Program of 51st AFA Convention

MONDAY, APR. 28

8:30 A.M.

Registration Begins.

Hotel Statler
Book-Cadillac Hotel

10:00 A.M.

Aluminum and Magnesium Session

Junior Section Room, Horace H. Rackham Educational Memorial.

"Influence of Inclusions on Properties of Sand Cast Aluminum Base Alloys," by A. W. Dana, L. J. Ebert, and G. Sachs, Case School of Applied Science, Cleveland; "Some Causes of Pinhole Blows in Magnesium Alloy Castings," by H. H. Fairfield and A. E. Murton, Bureau of Mines, Ottawa, Canada.

Malleable Session

"Malleable Iron Finishing," by E. M. Strick, Erie Malleable Iron Co., Erie, Pa.; "Malleable Foundry

Finishing and Inspection," by T. E. Poulson, Belle City Malleable Iron Co., Racine, Wis.

2:00 P.M.

General Meeting

Main Auditorium, Horace H. Rackham Educational Memorial

"Why the Importance of the Foundry Industry," by George T. Christopher, president and general manager, Packard Motor Car Co., Detroit.

4:00 P.M.

Aluminum and Magnesium Session

"Effect of Room Temperature Intervals Between Quenching and Aging of Aluminum Sand Casting Alloys," by R. A. Quadt, Federated Metals Div., American Smelting & Refining Co., Perth Amboy, N. J.; "Methods of Impregnation to Leak-proof Aluminum and Magnesium Alloy Castings," by E. V. Black-

mun, Aluminum Co. of America, Cleveland.

Educational Session

"Management's View of Apprentice Training," by R. S. Falk, Falk Corp., Milwaukee; "Foundry Training Course for College Graduates," by A. W. Gregg, Whiting Corp., Harvey, Ill.; "Foreman Training," by S. G. Garry, Caterpillar Tractor Co., Peoria, Ill.

Malleable Session

"Material Handling in a Malleable Foundry Processing Department," by N. J. Henke, Saginaw Malleable Div., General Motors Corp., Saginaw, Mich.; "Mechanized Malleable Foundry Finishing and Inspection," by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Gray Iron Shop Course (1)

Subject—"Variables Affecting Carbon Control in Cupola Operation." Dis-

cussion Leader—W. W. Levi, Lynchburg Foundry & Machine Co., Radford, Va.

7:00 P.M.

Educational Session and Dinner

Subject—"Management's Stake in Personnel Training." Speaker—R. L. Lee, General Motors Corp., Detroit.

8:00 P.M.

Sand Shop Course (1) (Malleable)

Subject—"Malleable Sand Problems." Discussion Leader—D. Tamor, American Chain & Cable Co., Inc., York, Pa.

TUESDAY, APR. 29

10:00 A.M.

Aluminum and Magnesium Session

"The Simplification of Light Metal Casting Design and Its Effect Upon Serviceability," by W. T. Bean, Jr., Continental Aviation & Engineering Corp., Detroit; "A New Gating Technique for Magnesium Alloy Castings," by H. E. Elliot and J. G. Mezoff, Dow Chemical Co., Bay City, Mich.

Brass and Bronze Session

"Radiography of Gun Metal Castings," by W. H. Baer, Nonferrous Section, Naval Research Lab., Washington; "Segregation in Manganese Bronze," by G. E. Dalbey, Mare Island Naval Shipyard, Vallejo, Calif.; "Spectrographic Analysis in the Manufacture of Brass and Bronze Ingots," by G. P. Halliwell and G. E. Staahl, H. Kramer & Co., Chicago.

Malleable Session

"An Interpretation of the Constitution of Iron-Carbon-Silicon Alloys," by J. E. Rehder, Bureau of Mines, Ottawa, Canada; "Effect of Section Size and Annealing Temperature on the Graphitization of White Cast Iron," by R. Schneidewind, A. Tang, University of Michigan, Ann Arbor, Mich., and D. J. Reese, International Nickel Co., New York.

Heat Transfer Session

"Heat Transfer Committee Report": "Studies on Solidification of Castings," by V. Paschkis, Columbia University, New York; "Solidification Rates of Aluminum in Dry Sand Molds," by H. Y. Hunsicker,

Aluminum Co. of America, Cleveland; "Calculating the Size of Gates—Risers," by N. Janco, Centrifugal Casting Machine Co., Tulsa.

12:00 P.M.

Aluminum and Magnesium Round Table Luncheon

Subject—"Recommended Practices for Aluminum and Magnesium Casting." Discussion Leader—W. E. Martin, Beryllium Corp., Reading, Pa.

Malleable Round Table Luncheon

Subject—"Chromium Determinations," "Grinding of Malleable Gates," "Exothermic Ladle Additions." Discussion Leader—C. F. Lauenstein, Link-Belt Co., Indianapolis.

2:00 P.M.

Brass and Bronze Session

"Correlation of Structure and Properties 85-5-5 Alloy Test Bars," by J. G. Kura, L. W. Eastwood, Battelle Memorial Institute, Columbus; "Gas Absorption Phenomena and Degasification of Cast Monel," by B. N. Ames and N. A. Kahn, New York Naval Shipyard, New York.

Steel Session

"Side-Blown Converter Practice," by F. Cousans, Catton & Co. Ltd., Leeds, England. Institute of British Foundrymen Exchange Paper; "Effect of Melting Practice on Properties of Medium-Carbon Low Alloy Cast Steels," by J. G. Kura and N. H. Keyser, Battelle Memorial Institute, Columbus; "The Influence of Selenium on the Sulfide Form and Ductility of Cast Steel," by A. P. Gagnebin, International Nickel Co., Bayonne, N. J.

Sand Session

"Elevated Temperature Properties of Steel Foundry Sands," by D. C. Williams, Cornell University, Ithaca, N. Y.; "Preparation of Foundry Sands for Market," by F. P. Goettman, G. F. Pettinos, Inc., Philadelphia; Committee Report: "Evaluation of Core Knockout," by H. W. Dietert, H. W. Dietert Co., Detroit.

Gray Iron Session

"Cupola Melting Phenomena," by D. W. Gunther and E. V. Somers, Westinghouse Electric Corp., Traf-



JAMES T. MacKENZIE, who will deliver the first Hoyt lecture. Dr. MacKenzie is chief metallurgist, American Cast Iron Pipe Co., Birmingham.

ford, Pa.; "Arcwelding of Cast Iron with Nickel Electrodes," by T. E. Kihlgren and L. C. Minard, International Nickel Co., Bayonne, N. J.

4:00 P.M.

Refractories Session

"Special Refractories in Metal Melting," by W. H. Henson, Norton Co., Worcester, Mass.; "Information Please"—Question and answer panel.

Patternmaking Session

"A Purchasing Agent's Considerations in Purchasing Patterns," by W. G. Schuller, Caterpillar Tractor Co., Peoria, Ill.; "Liquid Phenolic Casting Resins for Foundry Patterns," by C. R. Simmons, Durez Plastics & Chemicals, Inc., North Tonawanda, N. Y.

7:00 P.M.

Chapter Officers and Directors Dinner

Presiding—Max Kuniansky, Lynchburg Foundry & Machine Co., Lynchburg, Va.

8:00 P.M.

Sand Shop Course (2) (Nonferrous)

Subject—"Your Sand Pile." Discussion Leader—W. M. Ball, Jr., Magnus Brass Div., National Lead Co., Cincinnati.

Gray Iron Shop Course (2)

Subject—"Effect of Coke Quality on Cupola Melting." Discussion Leader



MAX KUNIATSKY, AFA vice-president, will act as chairman of numerous technical sessions. Mr. Kuniatsky, who has been nominated for the presidency of the association for 1947-48, is vice-president and general manager, Lynchburg Foundry Co., Lynchburg, Va.

—D. E. Krause, Battelle Memorial Institute, Columbus.

Inspection of Castings Session

"Importance of Radiography to Inspection," by E. L. LaGrelus, American Steel Foundries, East Chicago, Ind.; "Magnetic Particle Inspection in the Foundry," by W. E. Thomas, Magnaflux Corp., Chicago.

Heat Transfer Session

"Freezing Rate of White Cast Iron in Dry Sand Molds," by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland; "Thermal Conductivity of Three Sands," by C. F. Lucks, O. L. Linebrink, and K. L. Johnson, Battelle Memorial Institute, Columbus; "Influence of Properties on Solidification of Metals," by V. Paschkis, Columbia University, New York; "Feeding of Metal Castings," by A. F. Faber, Jr., H. B. Salter Mfg. Co., Marysville, Ohio, and D. T. Doll, Case School of Applied Science, Cleveland.

WEDNESDAY, APR. 30

10:00 A.M.

Gray Iron Session

"Critical Survey of Foundry Coke," by D. E. Krause and H. W. Lownie, Jr., Battelle Memorial Institute, Columbus; "Thermochemical Analy-

sis of Combustion in a Cupola," by H. E. Flanders, University of Utah, Salt Lake City.

Steel Session

"Slag Control in the Acid Electric Furnace," by H. H. Johnson, M. T. McDonough, and D. L. Radford, National Malleable & Steel Castings Co., Sharon, Pa.; "Application of a Single Slag Process to Basic Electric Steel," by M. V. Healey and R. W. Thomas, General Electric Co., Schenectady.

Sand Session

Committee Report—"New Tentative Standards for Grading and Fineness of Sands," by R. E. Morey, Naval Research Lab., Washington; "The Foundry Sand Laboratory," by O. J. Myers, Werner G. Smith Co., Minneapolis; "A Study of the Precision of Sand Test Data," by R. E. Morey and C. G. Ackerlind, Naval Research Lab., Washington.

12:00 P.M.

Canadian Luncheon

Brass and Bronze Round Table Luncheon

"Melting of Brass and Bronze"—H. Smith, Federated Metals Div., American Smelting & Refining Co., Pittsburgh.

Engineering School Graduates Luncheon

2:00 P.M.

Annual Meeting and Charles Edgar Hoyt Annual Lecture

Presiding — S. V. Wood, President, American Foundrymen's Assn.
Charles Edgar Hoyt Annual Lecture—"The Cupola Furnace," by J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham. Apprentice Contest Awards. Election of Officers and Directors.

Registration and Meeting Locations

• • • Foundrymen attending the AFA convention in Detroit may register at either the Statler or the Book-Cadillac Hotels. With the exception of the morning and afternoon sessions on Monday, which will be held at the Rackham Educational Memorial, the activities of the convention will center at the downtown Statler and Book-Cadillac Hotels.

7:00 P.M.

AFA Alumni Dinner

Speaker—John H. Van Deventer, Director of Information, Committee on Economic Development, New York.

8:00 P.M.

Sand Shop Course (3) (Steel)

Subject—"The Role of Sand in Hot Tearing." Discussion Leader—J. B. Caine, Sawbrook Steel Castings Co., Cincinnati.

Gray Iron Shop Course (3)

Subject — "Factors Affecting Cost of Cupola Operation." Discussion Leader—L. L. Clark, Buick Motor Car Co., Flint, Mich.

Plant and Plant Equipment Session

"Design and Operating Phases of Mechanized Foundries," by C. O. Bartlett, C. O. Bartlett-Snow Co., Cleveland.

THURSDAY, MAY 1

10:00 A.M.

Gray Iron Session

"The Graphite Phase in Gray Cast Iron," by R. W. Lindsay, Pennsylvania State College, State College, Pa.; "Metallographic Structure of Silvery Pig Iron," by R. Schneidewind, University of Michigan, Ann Arbor, Mich. and C. A. Harmon, Hanna Furnace Corp., Buffalo; "Micro-Radiography of Gray Cast Iron," by J. H. Schaum, E. T. Salkovitz, and F. W. Von Batchelder, Naval Research Lab., Anacostia Station, Washington.

Steel Session

"Occurrence of Intergranular Fracture in Cast Steels," by C. H. Lorig

(CONTINUED ON PAGE 145)

Heat Treatment And Aging 61S Sheet

By J. A. NOCK, JR.

*Assistant Chief, Physical Metallurgy Div.,
Aluminum Research Laboratories,
Aluminum Co. of America,
New Kensington, Pa.*

Despite its wide use, several misconceptions persist with respect to the age hardening and other characteristics of 61S aluminum alloy. This article explores the effects of solution heat treating temperatures, room-temperature aging, artificial-aging temperatures, interval of room-temperature aging prior to artificial aging, and reheating of heat-treated material, on physical properties of this alloy. The author also discusses the corrosion resistance properties of this alloy.

ALCOA 61S is an intermediate strength heat-treatable aluminum alloy specifically developed for structural applications requiring a relatively high yield strength in the fully heat-treated temper (i.e. artificially aged after solution heat treatment). Table I lists typical properties for 61S, which is an alloy of the magnesium silicide class, containing nominally 1.5 pct of this constituent with minor additions, 0.25 pct each, of copper and chromium. Products available include sheet, plate, extrusions, rolled shapes, tubing, rod, bar and wire.

One of the outstanding characteristics of 61S products is excellent formability in all available tempers. This property is of particular value in that either solution heat treating or artificial-aging operations can be eliminated in many cases by forming in the -W or -T tempers. Alcoa 61S also possesses excellent resistance to corrosion in all commercial tempers.

The combination of good mechanical properties, outstanding formability, and excellent resistance to corrosion makes 61S a very satisfactory alloy for many uses. It has found extensive use in bus and railway car construction, in marine construction, certain aircraft parts, beer barrels and many other applications. Applications requiring fusion welding are particularly adaptable to 61S, since products of this alloy are readily welded by present day commercial methods.

Despite the fact that 61S has been a standard com-

mercial alloy for over 6 years, considerable confusion and uncertainty exist regarding the age hardening and other characteristics of this particular alloy. In some quarters the belief exists that 61S-W does not age harden at room temperature while in other quarters it is believed that the usual high temperature precipitation or artificial-aging treatment is not required to produce -T properties if an extremely long period of storage at room temperature has elapsed. In view of these conflicting opinions it is felt that a summary of representative data covering the various steps in the thermal treatment of 61S products would be extremely useful and desirable.

Test Procedure

The data presented in this article have been assembled from various investigations carried out in the Aluminum Research Laboratories. In most of these investigations 0.064-in. thick sheet material fabricated under commercial conditions was used. This sheet was solution heat treated with and without artificial aging to determine the effects of the various factors involved. Reheating tests were also made on commercial 61S-T sheet.

The progress of aging and the effect of other heat-treating factors were evaluated through the determination of mechanical properties which are assembled

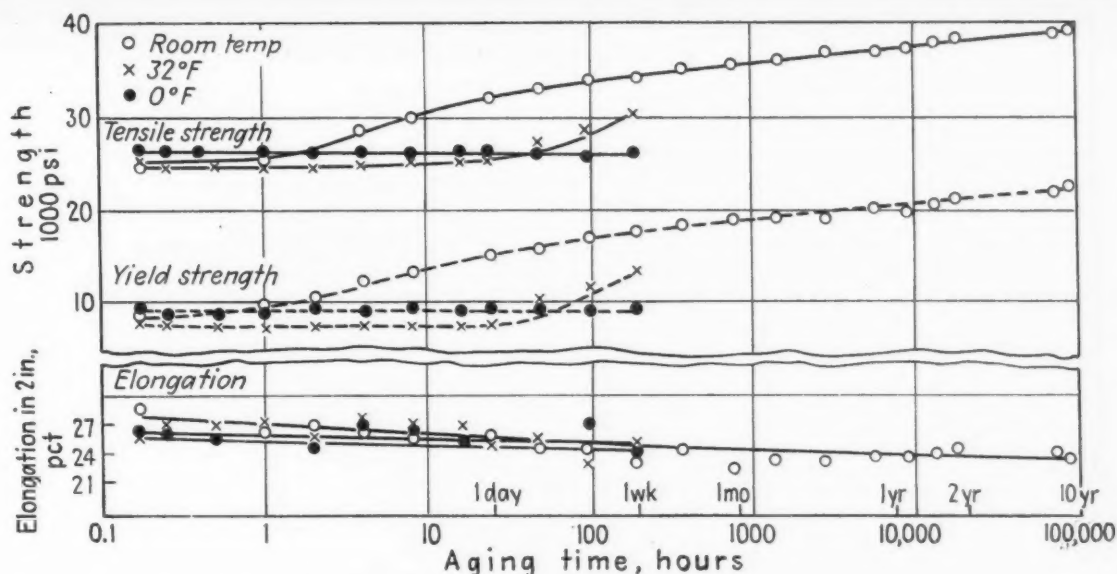


FIG. 1—Natural aging of 61S alloy; 0.064-in. sheet; X-grain specimens; heat treated 20 min in Homo at 970°F, cold water quench, aged at temperatures indicated.

in the tables accompanying this article and which are discussed in the following sections.

Room Temperature Aging

The natural or room-temperature age hardening of 61S-W is illustrated by the data plotted in fig. 1. The results indicate that 61S-W begins to age harden within about 1 hr after quenching from the solution heat-treating temperature and the strengths increase rather rapidly during the first 4 days, after which the rate of increase is considerably slower. Thus, contrary to the belief held by some, the tensile strength increases from about 25,000 to about 34,000 psi, while the yield strength rises from about 9000 to 17,000 psi, within 4 days after quenching. The elongation during this period decreases from about 28 to 25 pct. The increases in strengths after the initial 4-day period are considerably slower so that by the end of 1 year, additional increases of only about 3000 psi in tensile strength and yield strength occur with little change in elongation. Between 1 and 10 years, an additional increase of approximately 2000 psi will be obtained

for both tensile and yield strengths with practically no change in elongation values. While the actual magnitude of the increase in strengths during the initial period of 4 days is somewhat less than that commonly secured for 17S-T and 24S-T, the percent increase is of the same general order. In order to compare the room-temperature aging characteristics of 61S-W with several of the duralumin-type alloys, A17S-T, 17S-T, and 24S-T, respectively, aging curves of these alloys, as sheet, have been plotted in fig. 2. From these curves it is evident that during the first few days 61S-W ages at room temperature in somewhat the same manner as the higher strength duralumin type alloys. However, the age hardening of 61S-W at room temperature continues for much longer periods than are required to produce stable properties for the duralumin-type alloys.

The age hardening of 61S-W at room temperature can be suppressed by storage at temperatures of 32°F or lower. The behavior of a representative lot of 61S-W sheet is illustrated by the curves plotted in fig. 1 for comparison with the normal room-tempera-

TABLE I
Typical Mechanical Properties of 61S Products

Temper	TENSION				HARDNESS Brinell, 500-kg Load 10-mm Ball	SHEAR Shearing Strength, Psi	FATIGUE Endurance Limit, Psi
	Yield Strength, (Set=0.2 pct) Psi	Ultimate Strength, Psi	Elongation, Pct in 2 in.				
			Sheet Specimen (1/16 in. thick)	Round Specimen (1/2 in. diam.)			
61S-O.....	8,000	18,000	22	30	30	12,500	9,000
61S-W.....	21,000	35,000	22	25	65	24,000	13,500
61S-T.....	40,000	45,000	12	17	95	30,000	13,500

TABLE II
Effect of Heat Treating Temperature on Mechanical Properties of 61S-W and -T Sheet

Temp., °F	W Temper			90° Reverse Bends,* P	T Temper			90° Reverse Bends,* P	YS/TS, Pct
	Mechanical Properties				Mechanical Properties				
	TS, Psi	YS, Psi	Elongation, Pct in 2 in.		TS, Psi	YS, Psi	Elongation, Pct in 2 in.		
860	23,121	10,100	26.5	32	26,175	18,150	13.5	28	69
880	25,240	10,950	24.5	30	31,530	25,400	10.5	22	81
900	27,395	12,100	24.3	28	34,815	29,450	11.0	18	85
920	33,125	16,550	27.0	17	43,725	39,400	12.3	8	90
940	35,480	18,500	25.8	12	45,815	41,700	12.3	6	91
960	37,270	19,950	25.8	13	48,300	44,250	12.0	2	92
980	38,680	21,100	25.5	12	50,545	45,700	12.0	6	90

X-Grain, 0.064-in. thick specimens; quenched in cold water. * Reversals over radius of 0.25 in.; P = axis of bend parallel to rolling direction. ** Aged 8 hr 350°F.

ture aging curve. The data indicate that the age hardening of 61S-W is suppressed for approximately 1 day at 32°F while at 0°F no hardening could be detected for the duration of the survey period of 1 week. A comparison of these results with similar data for 17S-T and 24S-T reveals that all three alloys behave in much the same manner.

The data presented above clearly indicate that 61S-W age hardens at room temperature in a manner similar to other heat-treatable aluminum alloys but does not attain full -T properties within a period of 10 years at room temperature. This refutes another widely held idea regarding the age hardening of 61S-W, in that full -T properties would be secured after -W material was stored for an extended period at room temperature.

Solution Heat Treating

The typical properties of 61S-W and -T products are developed by a solution heat treatment at a nominal temperature of 970°F with a temperature range of 960° to 980°F. This temperature range was initially selected as a matter of convenience since several other aluminum alloys were also heat treated at this temperature. However, more of the major hardening constituent, Mg₂Si, is present in the alloy

than is dissolved by the commercial solution heat treatment at 970°F and somewhat higher strengths can be secured by heat treating at higher temperatures. By the same line of reasoning lower strengths will be secured if the solution heat-treating temperature is below the nominal value of 970°F. Mechanical properties in both the -W and -T tempers for 61S sheet, heat treated over the temperature range of 860° to 980°F and the range of 975° to 1075°F are assembled in tables II and III.

The data in table II show increases in strengths for both the -W and -T tempers as the solution heat treating temperature is increased from 870° to 980°F. The properties secured at 960° and 980°F are typical of 61S-W and 61S-T sheet (containing 0.61 Si, 0.29 Fe, 0.21 Cu, 0.92 Mg, 0.25 Cr, 0.10 Ti, rem. Al) heat treated under experimental conditions, although under commercial conditions which would involve flattening and straightening slightly higher strengths might be expected in the 61S-W. The data in table III also show that somewhat higher strengths can be secured by increasing the solution heat treating temperature up to 1025°F, at which temperature practically all of the Mg₂Si normally present in 61S (containing 0.53 Si, 0.24 Fe, 0.24 Cu, 0.02 Mn, 0.94 Mg, 0.26 Cr, 0.04 Ti, rem. Al) is in solid solution. Further increases in solution heat treating temperature usually produce little or no additional increases in strengths.

A comparison of the artificially-aged (-T) properties in tables II and III reveals an apparent discrepancy in that the strengths secured in table II, after heat treating at 960°F, are higher than those secured in table III after heat treating at 975°F. Likewise the strengths secured at 980°F in table II are higher than those secured at 1025° or 1050°F in table III. These differences are accounted for by a somewhat greater amount of Mg₂Si in the sheet used to secure the data in table II, the shorter aging treatment given the sheet used for table III, and possibly by a difference in the room-temperature aging interval prior to artificial aging. The last factor has a very pronounced effect upon the mechanical properties of 61S-T products as will be discussed later.

The fact remains, however, that the strengths of the 61S sheet and other products can be materially increased by using solution heat treating temperatures above the normal range of 960° to 980°F, but in

TABLE III
Effect of Heat Treating Temperature on Mechanical Properties of 61S-T Sheet

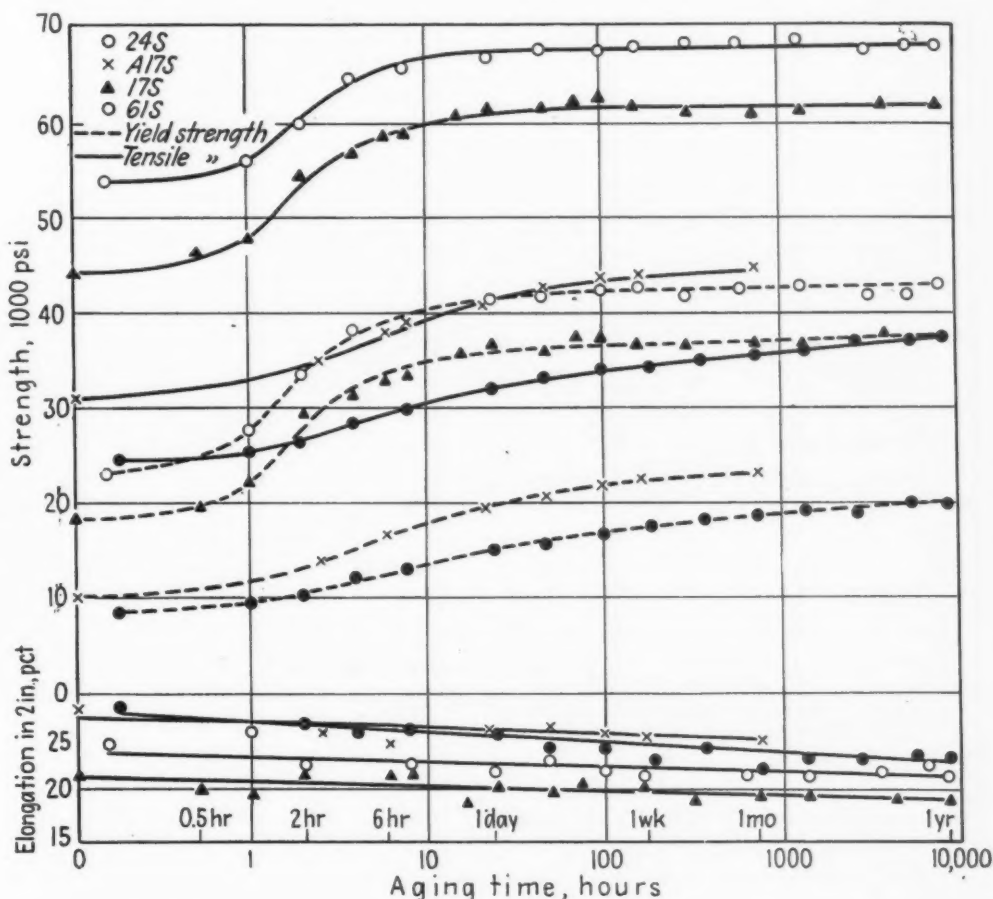
Temp., °F	Mechanical Properties			90° Bends*	
	TS, psi	YS, psi	El., pct in 2 in.	P	N
975	46,360	39,600	13.0	13	14
1000	50,000	41,950	13.0	11	13
1025	50,240	42,400	14.0	10	10
1050	50,240	41,950	14.0	7	9
1075	48,730	41,700	13.0	5	10

X-Grain 0.064-in. thick specimens; HT 20 min in homo furnace each temperature; cold water quench; age 12 hr at 320°F.

* Reverse bends over 0.25-in. radius; P = axis of bend parallel to rolling direction; N = axis of bend normal to rolling direction.

general, little if any benefit is secured by raising the heat treating temperature above 1025°F. The use of these higher solution heat treating temperatures is complicated by the fact that at these temperatures, high temperature oxidation is much more likely to occur. The tensile properties are lowered somewhat and the formability adversely affected to a very marked degree by such oxidation. It is recommended that anyone desiring to use solution heat treating temperatures above the normal range should carefully survey his heat treating installation to determine

61S-W and -T sheet, quenched in cold water, boiling water, and two types of air blasts. These data indicate that 0.064-in. thick 61S sheet may be quenched as mentioned with only minor decreases in strengths in the first group of samples. In the case of the second group of samples there is little or no difference between the properties of the materials quenched in cold water and boiling water but the material in the air blast (at a considerably slower rate than that used in the initial set of samples) had strengths considerably below the level of the cold water quenched samples.



whether any high temperature oxidation will be encountered. It may be necessary to use a dry air atmosphere to avoid oxidation when heat treating 61S products at these high temperatures (U. S. patent 1996379).

Effect of Quenching Rate

The maximum strengths of most heat-treatable aluminum alloy products are usually developed by quenching with minimum delay, in cold water. This practice generally causes undesirable distortion of parts formed in the annealed temper and necessitates a costly straightening operation. Fortunately, 61S is an exception, since this material can be quenched in a number of different media without serious or even appreciable decreases in mechanical properties. A limited amount of data are given in table IV for

The limited amount of data presented in table IV indicates that 61S sheet can be quenched over a relatively wide range of rates without appreciable effect upon the mechanical properties. Consequently, formed parts can be quenched in boiling water or oil and straightening operations thus eliminated.

Artificial Aging

The discussion under *Room Temperature Aging* indicated that the maximum strengths of 61S products could not be developed by aging at room temperature and that a precipitation treatment at elevated temperatures was required. Artificial-aging curves for a representative lot of commercial 61S-W sheet are given in fig. 3 for the temperature range 225° to 500°F. These data show that 61S-W sheet can be aged to produce typical -T strengths by a wide variety

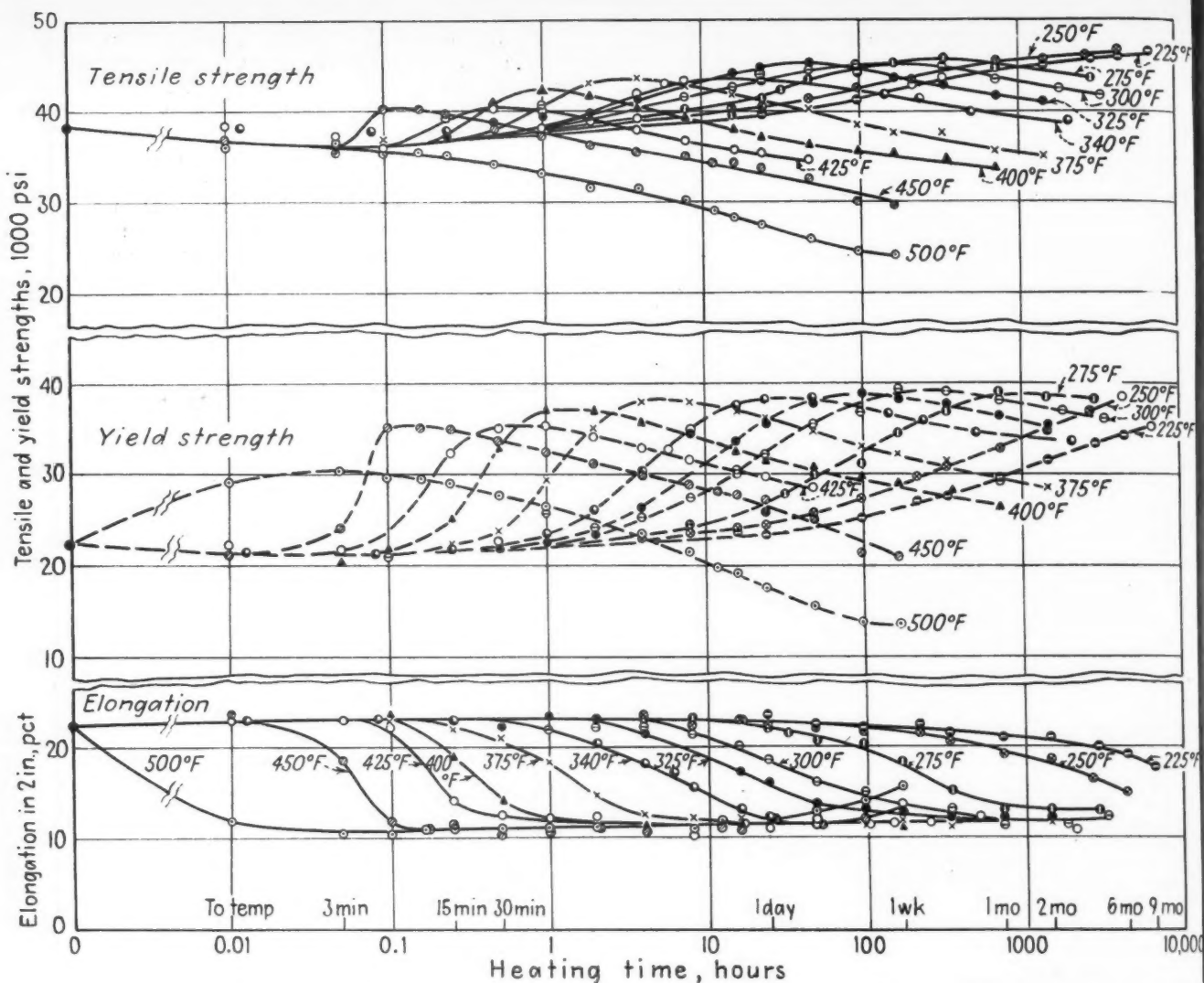


FIG. 3—Effect of elevated temperature exposure on tensile properties of 61S-W sheet. Commercially fabricated sheet; 0.064-in. X-grain specimens; all tests made at room temperature.

of aging times and temperatures. In general, the maximum strengths attainable at any artificial-aging temperature decrease slightly as the artificial-aging temperature is increased above a certain optimum range.

Thus it is possible to artificially age 61S-W products at temperatures as high as 375° or 400°F, but usually the strengths secured will be definitely lower than those secured when the same material is artificially aged in the temperature range of 325° to 350°F. In like manner, the curves of fig. 3 show that at still lower temperatures slightly higher strengths can be secured, but the times required are entirely beyond commercial consideration. The elongation values at the higher aging temperatures tend to approach a limiting value of about 10 pct, but slightly higher values are secured after aging at temperatures in the range of 300° to 350°F.

In commercial practice 61S-W is usually aged for 18 hr at 320°F or for 8 hr at 350°F. The data show that at 325°F the maximum strengths were not secured until 2 to 4 days had elapsed at this temperature. This fact indicates that aging at 320°F can be extended considerably beyond the 18-hr period without

danger of overaging and consequent losses in strengths. The optional treatment of 8 hr at 350°F cannot be compared directly with a 350°F curve in fig. 3, but an indirect comparison can be made with the curve for 340°F. The latter curve indicates that the maximum strengths, for the particular lot of material studied, are not attained until about 24 hr had elapsed at this temperature. This again leaves considerable leeway for artificial aging at 340° to 350°F before overaging occurs. It is thus evident that 61S-W can be aged at temperatures of 325° to possibly 375°F without serious danger of overaging, even though the aging periods exceed by a considerable margin those required to produce the maximum strengths at each temperature.

One of the factors which has a pronounced effect upon the strengths of 61S-T products is the interval at room temperature between quenching and the start of the artificial-aging treatment. Mention was made of this effect in the discussion covering the effect of solution heat treating temperature. Data illustrating this particular effect were obtained for artificial-aging treatments at temperatures of 320°, 340°, and 360°F. Study of these data indicates that the maximum

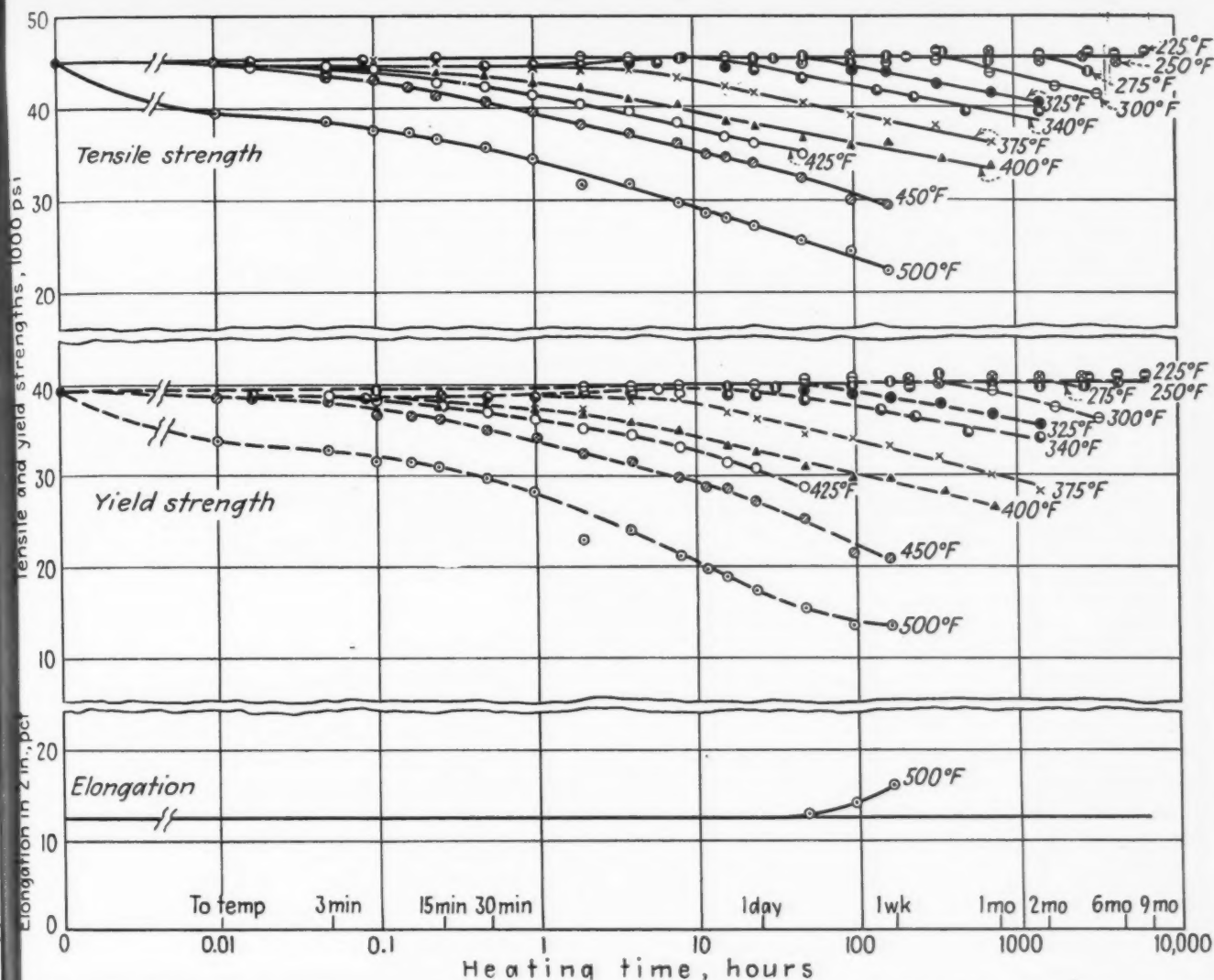


FIG. 4—Effect of elevated temperature exposure on tensile properties of 61S-T sheet. Commercially fabricated sheet; 0.064-in. X-grain specimens; all tests made at room temperature.

strengths for 61S-T sheet are secured if the artificial-aging treatment is started within 1 hr after quenching. Measurable decreases in strengths were secured when the interval was extended to 2 hr or more and the minimum strengths were generally secured after an interval of approximately 1 day. Intervals somewhat longer than 1 day apparently have little effect upon the strengths, although slight increases were secured after intervals of 3 to 4 weeks. A limited amount of data for more extended room-temperature intervals is presented in table V. These data indicate a recovery of tensile strengths to the level secured immediately after quenching after intervals of 6 months or longer. The yield strengths secured after these longer intervals were still considerably below the level secured immediately after quenching.

The data presented indicate that the maximum strengths are secured in unflattened 61S-T sheet if the artificial-aging treatment is started within 1 hr after quenching. Since this is impossible in most commercial operations, the level of strengths set for 61S-T products has been adjusted so that the decrease resulting from the interval between quenching and aging has been considered in establishing the typical values.

These decreases can be minimized to a marked de-

gree or eliminated by a preliminary artificial-aging treatment carried out after quenching but before the usual flattening and straightening operations (U. S. Patent 2083576). Since satisfactory designs have been developed using the strengths secured under current production conditions, no general use of the preliminary aging treatment has developed.

Reheating 61S-T Sheet

The behavior of 61S-T products upon exposure to elevated temperatures is a point of particular interest to design engineers and fabricators using these materials. In many instances the product is used to build a piece of equipment which may be operated at temperatures considerably above room temperatures and the effect of these temperatures upon the strengths will determine the life of the particular part. The effect of exposing commercial 61S-T sheet to temperatures in the range 225° to 500°F for extended periods is shown in fig. 4.

The effect of elevated temperature exposures can be most conveniently studied by referring to the curves in fig. 4. These curves very clearly indicate that the strengths of 61S-T sheet will decrease rather rapidly

after relatively short periods of exposure at temperatures of 375°F or higher. For example, at 500°F measurable decreases in strengths will be secured by the time 0.064-in. thick sheet has attained this temperature in a forced-circulation air furnace, and any additional time at this temperature will cause very rapid decreases in strengths. At 400°F, 61S-T sheet shows only small decreases in strengths for periods up to and including about 1 hr, but very substantial decreases in strengths will be secured after longer reheating periods. Reheating at the normal aging temperature of 320°F may be carried out for periods approaching 1 week with only very slight decreases in strengths. After approximately 2 months at 325°F, decreases of the order of 10 pct in tensile and yield strengths will be secured without any appreciable change in elongation values. At lower temperatures, 225° and 250°F, exposure periods as long as 9 months have produced no detrimental effects upon the strengths and elongation values of 61S-T sheet.

The data presented indicate that 61S-T products may be reheated at temperatures in the range of 225° to 250°F for probably 1 year or more without serious decreases in strengths. At 325°F some decreases in strengths will be secured after reheating for approximately 1 week while at 400°F the strengths of 61S-T sheet will decrease approximately 10 pct after an exposure period of about 1 hr. At higher temperatures the strengths of 61S-T, like other heat-treated aluminum alloy products, will decrease rapidly and after prolonged reheating will approach the level of annealed material.

Resistance to Corrosion

In this discussion of heat treating factors and their relation to the strengths of 61S products in the -W and -T tempers, no mention has been made regarding

TABLE V
Effect of Room-Temperature Aging Interval Upon Strengths of 61S-T Sheet

Room Aging Interval	Mechanical Properties					
	18 hr at 320° F			8 hr at 350° F		
	TS, psi	YS, psi	El., pct in 2 in.	TS, psi	YS, psi	El., pct in 2 in.
0	46,200	41,000	11.8	46,000	40,950	11.3
2 hr	46,650	40,250	13.3	46,250	40,750	11.8
1 day	43,500	36,200	14.0	44,550	39,000	11.8
1 week	44,100	36,450	14.3	43,500	37,850	12.3
1 month	46,000	36,500	15.0			
3 months	45,900	35,550	16.8			
6 months	46,700	37,900	14.8			
1 year	46,200	34,800	17.0			

Heat 30 min at 970°F; cold water quench 0.064-in. thick, X-grain specimens.

resistance to corrosion. It is obvious that corrosion tests covering all the factors discussed would entail a tremendous amount of testing. Numerous atmospheric and accelerated-exposure tests of many lots of 61S-W and -T have produced extremely low losses in strength and elongation for materials covering many of the factors discussed in this article. In general, the resistance to corrosion of 61S-W and 61S-T sheet is of a very satisfactory order and is not affected to any marked degree by variations in heat treating temperature, quenching rate, artificial-aging treatment, or reheating.

TABLE IV
Effect of Quenching Rate Upon Mechanical Properties of 61S-W and -T 0.064 in. Thick Sheet

Quench	Mechanical Properties					
	61S-W			61S-T		
	TS, Psi	YS, Psi	Elongation, Pct in 2 in.	TS, Psi	YS, Psi	Elongation, Pct in 2 in.
Cold water	38,350	19,550	25.0	47,500	38,750	14.5
Boiling water	38,050	18,400	25.8	45,550	37,400	14.8
Air blast (high velocity)	37,700	18,400	25.5	45,550	37,000	14.8

Heat 20 min at 960°F. -T—Aged 18 hr at 320°F 1 day after quenching.

Quench	TS, Psi	YS, Psi	Elongation, Pct in 2 in.	
	TS, Psi	YS, Psi	Elongation, Pct in 2 in.	
Cold water	47,130	41,380	13.0	Aged immediately after quenching
	45,750	39,100	14.0	
Boiling water	47,040	41,100	13.5	Aged immediately after quenching
	45,030	37,650	13.5	
Air blast (low velocity)	33,950	25,400	12.0	Aged immediately after quenching
	34,790	26,150	13.0	

Heat 20 min at 970°F, age 18 hr at 320°F. All tests X-grain.

Evaluating Pickling Acid Inhibitors

In the evaluation of inhibitors in pickling acid solutions, it is highly desirable to be able to determine the extent to which the steel surface has been attacked. The authors describe an easily performed colorimetric test method that has been successful in obtaining reproducibility to within 3 pct accuracy, and outline the analytical procedure to be followed in performing the evaluation test.

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USE of mineral acids, principally sulfuric and hydrochloric, for the pickling of iron and steel is an established operation that is made possible by the incorporation of a pickling inhibitor in the acid solution. The actual mechanics involved by which the addition of a small percentage of inhibitor to the acid solution allows the reaction on the mill scale to proceed practically uninterrupted while the known reaction of the acid on the iron or steel is inhibited to only a fraction of its uninhibited rate, has been discussed by various writers.¹⁻⁵

Such phenomena as overvoltage, lowering of surface tension and viscosity, and the formation of complex groups between hydrogen ions and inhibitor groups have been proposed. In most instances, these can be shown not to account for the great inhibiting action possible with very small quantities of inhibitor. Pure adsorption of a very porous layer of inhibitor seems to explain inhibition more adequately.⁶

Although acid inhibitors, satisfactory for pickling operations, were developed years ago, it has only been in recent years that their use has been extended to permit the widespread use of acid for the removal of water or steam-deposited scales from industrial equipment. Many papers^{7,8,9} have been published on the acid cleaning of various types of equipment and in each case the author has stressed the importance of the inhibitor.

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High standards have been set. The inhibitor must not materially affect the rate of reaction of the acid on the scale. The products of the reaction must not have an adverse effect on the inhibitor, and the inhibitor must be stable over a considerable temperature range.⁴ Another important requirement is the rinsibility of the inhibitor and condition of the metal surface after treatment.^{2,3,5}

Of the utmost importance in the evaluation of acid inhibitors is the determination of the extent to which the acid treatment has attacked the cleaned steel surface. Previously described standard methods^{10,11} are (1) determination of the volume of hydrogen evolved, and (2) gravimetric weight loss of steel test samples. The hydrogen evolution method is somewhat unsatisfactory for most precise work since the amount of hydrogen dissolved in the acid solution and adsorbed in the sample is not readily ascertained. The weight loss method is quite adequate except for those cases where complete inhibition is approached.

A given amount of acid attack on a clean iron or steel surface will result in a definite concentration of iron in the acid solution. Thus, an accurate determination of the concentration of iron in a given amount of acid, which has been allowed to react on a given area of iron or steel, can be interpreted in terms of degree of inhibition.

A colorimetric method of determining the iron concentration in inhibited acid solutions for evaluating the inhibitor has been developed and is proposed herein. The determination is easily performed and can be made visually with Nessler tubes, or, for greater accuracy, with the aid of a photoelectric colorimeter. In the procedure outlined here, standardization iron wire analyzing 99.85 pct Fe minimum was used. Iron or steel test panels can be used in place of the iron wire. Some advantage in using test panels should be noted since different degrees of inhibition may be obtained on different grades of iron or steel. In addition, use of test panels makes macroscopic and microscopic examinations of the metal surfaces possible. However, for rapid screening tests

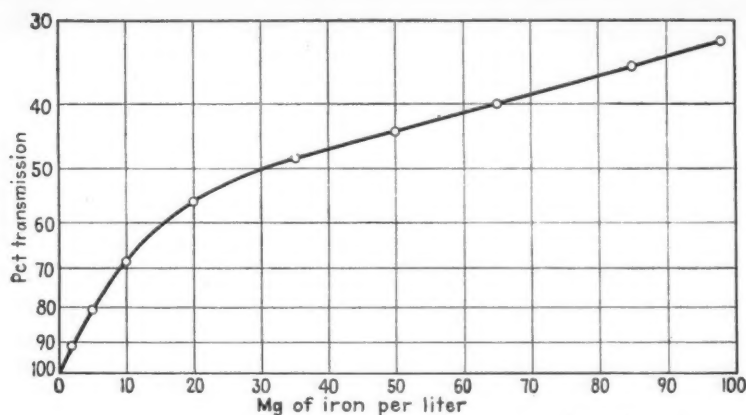


FIG. 1—Calibration curve for determination of iron concentration by photo-colorimetric method.

the use of iron wire has been found to be quite satisfactory.

Analytical Procedure

The inhibitor to be tested is added in the recommended ratio to the desired concentration of sulfuric or hydrochloric acid. A test is performed on each inhibited acid solution and on an uninhibited acid solution of the same concentration. The following procedure is followed:

- (1) Fifty milliliters each of inhibited and uninhibited acid is added to 125 ml flasks and placed in a constant temperature bath and brought up to any desired temperature.
- (2) Twelve inches of standardization iron wire is wrapped into a coil, by winding around a glass rod, and is carefully cleaned by dipping successively into acetone, benzene, acetone, distilled water, 1 min in uninhibited acid and again in distilled water. The same cleaning procedure is followed if test panels are used.
- (3) The coils or test panels are then dropped into

the various acid solutions in the flasks and exposed for a definite time interval.

- (4) The coils or test panels are then removed and carefully rinsed with distilled water allowing thorough drainage into each solution.
- (5) The acid solutions are then cooled to room temperature and diluted to 100 ml in volumetric flasks using distilled water. Uninhibited acids are diluted to one liter.
- (6) The iron concentration is then determined by analyzing for iron colorimetrically.

Visual Determination

For visual determination of the iron concentration, the following procedure is followed: Into a 50-ml Nessler tube add 1.00 ml of 10 mg per liter standard iron solution, 2.00 ml of N/1 sulfuric acid,* 2 ml of 1 pct hydrogen peroxide,** 10.00 ml of N/10 ammonium thiocyanate*** and dilute to the 50-ml mark with distilled water. To another Nessler tube add 2.00 ml of N/1 sulfuric acid, 2 ml of 1 pct hydrogen peroxide, 10.00 ml of N/10 ammonium thiocyanate, and then distilled water until within a few milliliters of the 50-ml mark. The unknown iron solution is then

*Sulfuric acid, approximately N/1. Dilute 114 ml of concentrated sulfuric acid to four liters. **Hydrogen peroxide, 30 pct and 1 pct, freshly prepared by dilution when needed. ***N/10 Ammonium thiocyanate. Dissolve 7.600 g of C. P. salt in one liter of solution. ****Standard iron solutions. Dissolve 0.086 and 0.860 g of Reagent Grade ferric alum in one liter of solution containing 2 ml of N/1 sulfuric acid. These solutions contain 10.0 and 100 mg of iron per liter of solution.

added from a burette in 0.1 ml increments until the pink color matches the standard iron solution.**** The quantity of iron dissolved in the unknown solution is calculated from the following formula:

$$\text{Fe (mg per liter solution)} = \frac{10.0}{\text{ml unknown iron solution}}$$

Photocolorimetric Determination

For photocolorimetric determination of iron concentration, a calibration curve is prepared by pipetting known concentrations of standard iron solutions, in the range 0 to 100 mg, into a solution composed of 2.00 ml of N/1 sulfuric acid, 2 ml of 1 pct hydrogen peroxide, 10.00 ml of N/10 ammonium thiocyanate, and finally diluted with distilled water to 100 ml in a volumetric flask. After approximately 20 min, the percent transmission of the solution is determined in a photometer. Distilled water as a standard comparison liquid is set at 100 pct transmission. A green filter is employed. The percent transmission plotted against milligrams of iron per liter on a semilogarithmic scale yields a calibration curve such as that shown in fig. 1.

Unknown concentrations of iron in the range 0 to 100 mg per liter are determined by substituting the unknown in the above procedure and determining the percent transmission. With this value the milligrams of iron per liter is obtained from the curve.

In those cases where the inhibitor itself lends a definite color to the acid solution, the color is destroyed

TABLE I
Typical Results Obtained in the Evaluation of Various Inhibitors

Acid Solution, Weight pct	Inhibitor and Weight Pct Concentration	Iron Concentration, Mg per liter	Percent of Uninhibited ¹
20 pct H ₂ SO ₄	None	125	.....
20 pct H ₂ SO ₄	0.10 pct Commercial Inhibitor A	14.5	11.6
20 pct H ₂ SO ₄	0.10 pct Commercial Inhibitor B	0.6	0.5
20 pct HCl	None	250	.....
20 pct HCl	0.10 pct Cyclohexylamine	65.0	26.0
20 pct HCl	0.10 pct Commercial Inhibitor A	105	42.0
20 pct HCl	0.025 pct Commercial Inhibitor C	14.5	5.8
20 pct HCl	0.40 pct "Nitrogen Base" A...	5.5	2.2
20 pct HCl	0.40 pct "Nitrogen Base" B...	5.5	2.2
20 pct HCl	0.40 pct "Nitrogen Base" C...	23.0	9.2
20 pct HCl	0.40 pct "Nitrogen Base" D...	24.0	9.6
20 pct HCl	0.40 pct "Nitrogen Base" E...	4.5	1.8
20 pct HCl	0.40 pct "Nitrogen Base" F...	3.5	1.4
20 pct HCl	0.40 pct "Nitrogen Base" G...	65.0	26.0
20 pct HCl	0.40 pct "Nitrogen Base" H...	31.0	12.4
20 pct HCl	0.40 pct "Nitrogen Base" I...	4.0	1.6
20 pct HCl	0.40 pct "Nitrogen Base" J...	56.0	22.4

¹ Ratio of iron concentration in an inhibited acid to that in the same acid uninhibited. The lower the value, the better the inhibition.

by a hydrogen peroxide treatment after the iron wire test but before the solution is prepared for colorimetric analysis. The procedure is to add 5 ml of 30 pct hydrogen peroxide and heat the acid solution to the boiling point for 20 min. If necessary, the procedure can be repeated several times.

Table I gives typical results, reproducible to at least

3 pct accuracy, on the evaluation of various inhibitors using the iron wire test at 140°F for 1 hr. For concentrations of iron above 100 mg per liter the visual method using Nessler tubes was employed. The low concentrations were determined using a Cenco-Sheard-Sanford photometer; however, the visual method is applicable.

All-Welded Hydraulic Scraper

CONTINUING the trend toward the use of all-welded construction, hydraulic scrapers, ranging in size from 3 to 6 yd, are being produced in quantity in the unusually short time of 248 man-hr by the Henry Mfg. Co., Topeka, Kan. No castings are used in the design of the unit, and one of the most significant advances is the welding of the bearing housing directly to the frame. Bolts, nuts and studs are not used and, in addition, the need for casting the bearings themselves has been eliminated.

The all-welded bearings, shown in fig. 1, are capable of carrying the entire weight of the scraper, which is about 5200 lb, plus a full load of dirt. The construction is very simple as it is made up of $\frac{3}{8}$ -in. plate and double-strength pipe of 3-in. ID to accommodate the 3-in. shaft. The finished housing weighs only 25 lb.

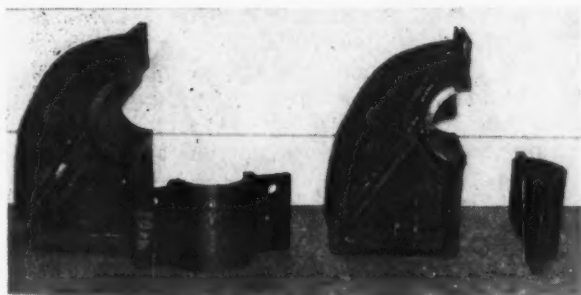


FIG. 1—All-welded bearing housing which is welded directly to the frame. The use of bolts, nuts and studs has been entirely eliminated.

Fig. 2 illustrates the welding of the tong and underframe after it has been positioned in a jig. The tong is made from 7-in. double-strength pipe and 7-in. box channels. It will be noticed that the bearings shown in fig. 1 have been welded to the end of the box channels. All welding is performed manually, using Lincoln Electric Co.'s shielded arc equipment.

The pan assembly for the scraper is fabricated from plate ranging from $\frac{1}{4}$ to $\frac{1}{2}$ in. The part pictured in fig. 3 is the pan assembly of the size used on a 4-yd scraper. Completely welded, it weighs only 1035 lb.

The fundamental objective in building any scraper is to guarantee its ability to carry a maximum load and, to accomplish this, requires an exceptionally rigid wheel. Such a unit is not standard, and so to provide these scrapers with a wheel that will insure



FIG. 2—Welding the tong and underframe in an assembly jig. Double-strength 7-in. pipe and 7-in. box channels are used for the construction.

years of trouble-free operation, a special wheel was designed by the Henry Co.

The disk for the wheel is cut from $\frac{1}{4}$ -in. plate with a 6 $\frac{3}{4}$ -in. OD steel casting used for the hub. These hubs are the only castings used in the entire structure. Stiffeners, also fabricated from $\frac{1}{4}$ -in. plate, provide rigidity to the wheel which, when completed, weighs 125 lb. Manufacturing time is 2 $\frac{1}{2}$ hr.

Subject to the most rough and abusive service, the all-welded scraper is said to have greatly improved working life, and while much less subject to breakage because of the structural strength of the plate, it is very readily repaired by welding if breakage should occur.



FIG. 3—Substantially built jigs assure ease and accuracy of welding this pan assembly for a 4 yd scraper.

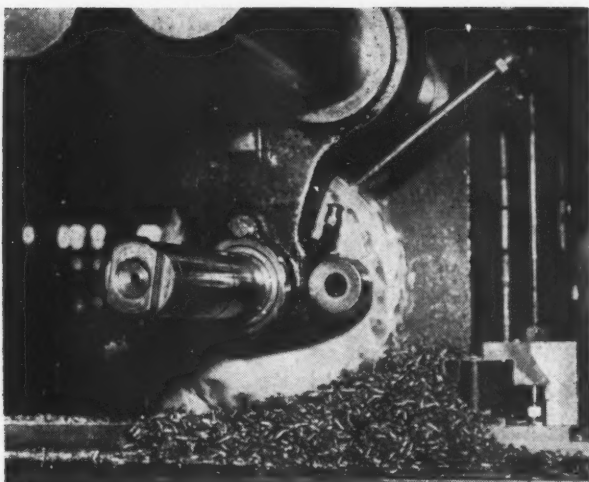


FIG. 58—Although straddle milling finishes two sides simultaneously, the setup time for each cutter replacement will probably offset the advantages thus gained.

GOOD carbide steel milling starts with correct milling practice. Before going into a detailed consideration of the factors that make for good milling practice generally and good carbide milling practice specifically, it is worthwhile to consider, briefly, what are the earmarks of correct milling.

Economical cutter life, acceptable finishes or surface conditions, and finally, specification accuracies are the end results of the correct removal of metal by the technique of milling. Each of these will be considered briefly in the following discussion.

Economical cutter life depends upon the nature of the job and operation, to mention one of several important considerations. For example, short runs or small job lot operations, in the neighborhood of 50 pieces, as opposed to production runs, call for entirely different approaches. In the former, the number of square inches of metal removed can be radically reduced in favor of higher speeds and feeds. The cutter, at the end of a run of this kind, is generally replaced, seldom is it applied to a following order. In this case then, the highest speed and feed combination, assuming the workpiece can take it, should be selected to the end that the cutter is dull when the job has run out. Thus the advantages of a minimum of cutting time help to reduce the overall cost.

In the case of a small component of cast steel, of which only 50 pieces are required, it would be considered good practice to use a surface foot rate of 500, although 350 is considered a good normal for this type of material. Cutter life, of course, will be shortened, but since one cutter will last for the duration of the job, and will be resharpened as a matter of course before being used on another job, the increased rate of production will justify the increased cutting speed.

On the other hand, an entirely different approach to the problem of cutter life is presented when schedules call for the maximum number of work-

How to Use Carbide

pieces of a certain type that can be produced in three 8-hr shifts, continuously throughout the year. This is the case with certain motor pole pieces where the rate selected is a reluctant 400 sfm. For soft steels (140 Bhn) having eight points of carbon, similar to this specification, rates as high as 750 sfm are considered normal, and 1000 sfm are sometimes used, but in this case the operation demands close scrutiny of the overall economies.

Down time on the machine is an important item and is obviously affected by the cutter life, or the number of cutter removals and replacements per 1000 pieces. The cutter life in this operation is listed at 150 pieces per grind, or approximately six cutter replacements per 1000 pieces. At 15 min each, as a liberal figure, $1\frac{1}{2}$ hr is the down time penalty. If, however, a rate of 600 sfm were chosen, the cutter life, as shown by experience, would be reduced to 75 pieces, and in this case 12 shutdowns of 15 min each would be the penalty; a loss of 3 hr of production.

At the 400 sfm rate 12 pieces are milled each hour; at the 600 sfm rate 16 components are machined. Thus the down time loss in pieces produced at the 400 foot rate is 18 pieces; at the 600 rate it is 48. At the former rate it required approximately 90 hr to produce 1000 finished components; at the latter, 60 hr. The total time for the former, therefore, adding the $1\frac{1}{2}$ hr of down time, is $91\frac{1}{2}$ hr; for the latter, adding the 3 hr loss due to machine time, it is 63 hr.

This is only a portion of the story of cutter life, however. The higher rate required twice the number of cutter grinds, the use of twice as much carbide and approximately twice as much diamond wheel abrasive material. And this list can and should be added to if the full and complete answer is sought—as it needs to be in good metal removal practice.

The final answer cannot be set forth here (although the illustration is taken from a current and actual operation) but this much of the exposition indicates the approach that is necessary to something like an intelligent answer to the question: "What is good cutter life?" Certainly it can never be based on for example, the square inches of metal removed in test runs conducted under ideal conditions.

Other factors also deserve consideration when attempting to arrive at an answer to this all-important question. The pole piece operation was formerly performed straddle fashion. It is now performed as shown in fig. 59. Cutter life again influences the decision along lines that run as follows: Straddle milling requires an arbor setup and something like $1\frac{1}{2}$ hr to establish the correct relationship between the cutters and the workpiece, but two sides of the component are milled in one pass. The simple face mill

Cutters for Milling

- ... Cutter Life
- ... Surface Finish
- ... Holding the Workpiece
- ... Grinding the Cutter

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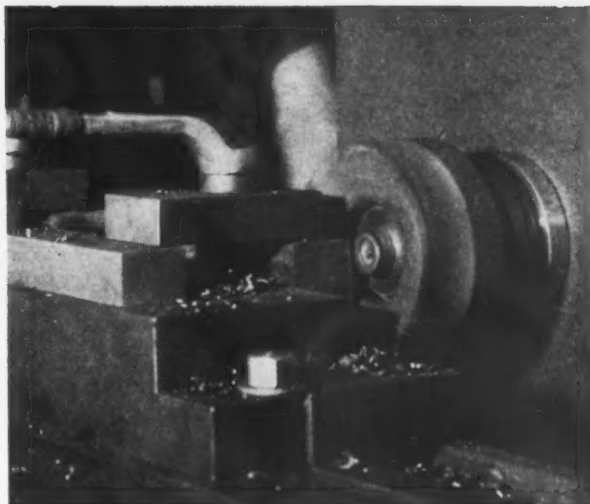


FIG. 59—The face milling operation shown here replaces the straddle milling shown in fig. 58 and permits of higher feeds and speeds. Reduced setup time, however, must be balanced against earlier blade deterioration.

The various factors which must be considered in establishing good practice for milling operations are discussed in detail in this tenth article in a series covering all phases of carbide milling. The factors discussed include attention to economical cutter life, acceptable surface finish, and adherence to specified dimensional accuracy, as well as the selection of the proper type of machine, holding and handling of the workpiece and grinding the cutter.

setup (fig. 59) results in only one side milled per pass, but the machine down time is far less for each cutter replacement. The latter method of milling permits of higher rates of speeds and feeds than the former; these must be balanced against the earlier deterioration of the blades at these increased rates.

Acceptable Finishes

Other important points beyond cutter life remain to be considered as characteristics of good milling practice; for example, suitable finishes and acceptable surface conditions. The two are necessarily considered separately, since they are here meant to represent two entirely different phenomena associated with milling. In the first, finishes in terms of microinches is meant; in the latter absence of break-out along the leaving edge of surfaces having cored areas. An automotive cylinder block and head present good subjects for illustration. In the former, so-called break-out due generally to a relatively high sfm is of little or no consequence, since subsequent boring operations in the cylinders remove such damage. But in the head, this phenomenon is the cause of frequent rejection.

Thus a component may be acceptable for its micro-

inch finish but rejectable for its break-out. Good milling practice demands that the specifications be met, whatever they are, provided only they are, at this stage of the development, possible with this technique of metal removal.

The latter qualification, namely, the present stage of development, is necessary and deserves a further word. A combination of the right sfm and corner angle for the milling of a cylinder head will prevent much, if not all, of break-out. Additional developments in this, or other directions, may push forward the present known limits of milling.

Specification accuracies have to do not only with dimensional accuracy and tolerances, but may refer very pointedly to flatness of the surface milled. These limits have been pushed upward immeasurably in very recent years. For example, a hydraulic pump cylinder component is now being milled in one pass at 30 ipm to a finish and flatness that satisfies severe hydraulic test specifications. Until recently this same piece was rough and finish milled, then ground for the necessary flatness and microinch recording.

On the present level of development, it is possible to obtain superior finishes in one pass at relatively heavy chip loads, thus eliminating a finish milling operation followed by grinding. Carbide milling

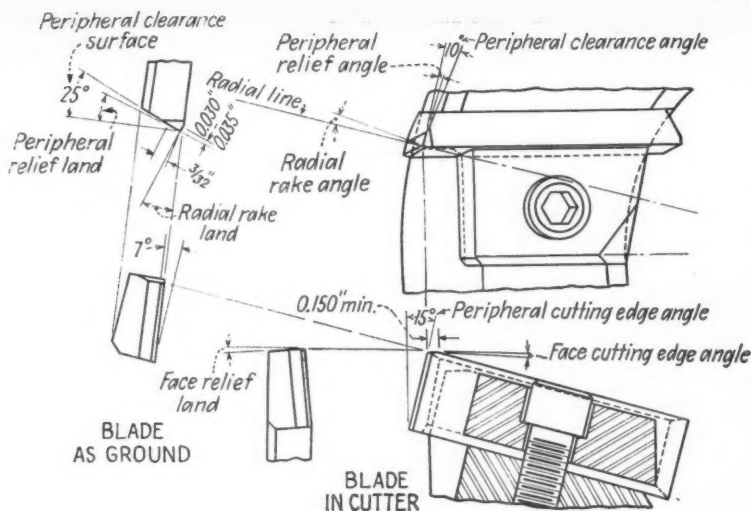


FIG. 60—Designation and location of the various cutting and clearance angles to be considered in grinding milling cutters for maximum life and performance.

widens the range of accuracy and tolerance possibilities, since the heat of work appears largely in the chip and only incidentally and to minor amount in the workpiece. Hence distortion, always associated with earlier and older milling methods, has been eliminated.

A properly designed cutter must be properly applied for good milling results. For example, the radial represents a better design than an axial. More economical use of carbide is possible with the former as already explained in detail. If to this is added a cutter body that is a precision tool holder, then the solid carbide blades can be ground as single point tools, or approximately so, in a grinding jig on a simple inexpensive surface grinder. Moreover, with a precision tool holder as a body, and with all slot bottoms in the same plane to close tolerances, then the blades can be set with the body mounted on the spindle of the machine as explained in an earlier part of this series*. This results in elimination of spindle inaccuracies and runout.

*Part 3, published in the Feb. 27, 1947, issue of THE IRON AGE.

Perhaps the greatest advance with this carefully designed and engineered milling cutter is the breaking of the bottleneck of milling, namely, expensive and time-consuming cutter grinding requiring skilled personnel. Thus far, milling has been re-

stricted to larger plants, the smaller being incapable, financially and otherwise, to indulge in this highly desirable method of metal removal. For our overall American industrial economy, good milling practice demands that milling be brought within the reach of the smaller organization.

Getting down to the actual job of milling a component, the cutter must be properly selected; its diameter, for example, must be in correct ratio to the workpiece face, somewhere in the neighborhood of 8:5 as previously explained. Also, good practice demands the elimination and rejection of all complicated, fancy setups calling for arbor and straddle arrangements, when a homely face mill will do; and above all, the outlawing of all expensive and hard-to-grind form cutters, when a simple and less expensive change in the fixture or other device will permit the use of standard cutters.

Table IX shows the optimum cutting angles for milling various materials to obtain good results, particularly as regards cutter life. The letters given therein refer to those shown in fig. 60 which also indicates the even more important clearance angles from which proper selection, according to the workpiece material specification, must be made. Clearance angles are far more critical than cutting angles in their effect upon the end point, namely, a good milling job well done. Most important is the selection of 15° face clearance angles for the following: Nonferrous materials such as aluminum and its alloys; magnesium, and plastics; and the ferrous specifications, namely, wrought iron, low carbon steel (under 12 points of carbon) and the stainless steels, particularly type 304.

Also recommended is the use of 7° clearance angles on both the OD and the face for all straight steels and cast irons except those mentioned above. The 7° OD clearance angle is specific and does not include the use of another or secondary angle. Likewise these clearance angles are ground without benefit of a land; that is, they are ground to the cutting edge.

These recommendations are directly opposed to other recommendations and older usages, particularly those that represent a hangover from the days of high speed steel. They can and should be used, however, without hesitation or fear, since they are solidly founded on well-established and wide experience.

The Machine

"The proper machine for the job," although a threadbare observation, must be repeated and stressed here, if only because it is so frequently violated. First, a standard machine rather than a special; then a machine designed for carbide rather than a pitifully patched up noncarbide milling machine, however, new or good otherwise; third, a machine with more rather than less power. Limitations no longer exist in the cutting material, but only the nature, material and cross-sectional dimensions of the workpiece. What the upper limit is in the cubic inch per minute rate of metal removal no one knows, because no one has had amounts of power larger than 50 hp per spindle available up to this writing. If a component seems by good judgment to permit of a 100 cu in. per min rate of steel removal,

Material to be Milled	Grade*	Angles (See fig. 60)					
		Cutting				Blade Grinding	
		A	B	C	D	Y	Z
Steel	KM, K2S	- 7°	5°	0°-10'	5°	21°-40'	20°
Cast iron	K6	+10°	7°	0°-10'	7°	4°-40'	22°
Brass and bronze	K6	+10°	7°	0°-10'	7°	4°-40'	22°
Light alloys	K6	+15°	7°	0°-10'	15°	0°	22°

* These are Kennametal grades, but the same angles apply to corresponding grades of other cemented carbides.

the request for more than 50 hp should be given serious consideration.

There are five specifications that should be built into a good carbide milling machine. They are: (1) Rigidity; greater mass and structural strength is required to resist the heavy cuts and absorb vibration. (2) Flywheel; for smooth flow of power to the cutter, thus overcoming the effects of coarse pitch. (3) Increased power; and lots of it. A standard No. 2 machine is commonly rated at 7.5 hp, whereas a carbide machine of the same physical size should have 20 hp. (4) Separate table feed motor; this prevents embarrassing blade breakage when the machine stalls. The overload relay should be on the table feed motor, leaving the spindle motor to run the cutter free in the job. (5) Elimination of mechanical brakes; electrical braking should replace mechanical brakes which, required to absorb the energy of the flywheel, tend to add to the maintenance bills.

Such items as increased bearing gear train and clutch capacities are, of course, obvious for a more highly powered machine.

Just as important in their effects on the final results are the setting up and operation of the machine, including such items as:

(1) Climb, not convention mill; the forces in the former are directed downward against the solid metal of the table instead of the air above the workpiece. Furthermore, in climb milling the chip thickness and formation is far more favorable to carbide milling than in the conventional technique.

(2) Locate the workpiece for the greatest rigidity and stability; for example, on the table close to the column as shown in fig. 61, and properly support the arbor with supports to prevent arbor spring.

(3) Always mill against a solid positive stop; for example, not against the movable jaw of a vise. (See fig. 62.)

Select proper speeds and feeds. Table III (Part 3, Feb. 27) and table VI (Part 8, Apr. 10) are starting points for the proper approach to this problem. Common sense and judgment must be added, and the feed rate tentatively selected should be checked both for the chip load and the horsepower.

Choose a chip load of 0.010 in. as a beginner. The feed rate is calculated by multiplying by the number of teeth in the cutter, which results in the feed

Previous articles in this series covering carbide milling were as follows:

Part No.	Subject	Issue Date
1.	Fundamentals of carbide milling.	Feb. 13, 1947
2.	Low carbon steel and wrought iron.	Feb. 20, 1947
3.	Straight carbon and cast steel.	Feb. 27, 1947
4.	Heat-treated steels.	Mar. 6, 1947
5.	Armor plate, heat-treated alloy steel, stress proof steel, die plates.	Mar. 13, 1947
6.	Stainless steels.	Mar. 20, 1947
7.	Semisteel, alloy cast iron, Ni-Resist.	Mar. 27, 1947
8.	Factors governing cutter life, selecting feed rates.	April 10, 1947
9.	Regulating life between grinds, cutter design.	April 17, 1947

per revolution. When this result is multiplied by the rpm, the feed in inches per minute (ipm) is obtained.

Now check the power that will be needed at the spindle using this feed rate. If the piece to be milled is 4 in. wide and the depth of cut is 0.125 in., then the cross-sectional area of the cut is $\frac{1}{2}$ sq in. Suppose an 8-in. eight-tooth cutter is selected for steel to be milled at 500 sfm. The rpm is approximately 250. The feed rate with a 0.010-in. chip load is 0.080 in. per revolution and 20 ipm. The cubic inches removed each minute are therefore 10. If the K-factor or the horsepower required to remove a cubic inch per minute is 0.5, then this operation calls for approximately 5 hp. The machine can now be intelligently selected for power.

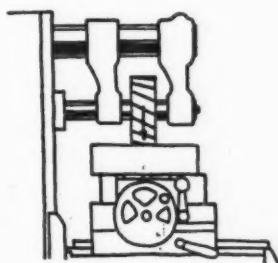
No one has yet found a good reason for using coolant with carbide milling.

The Workpiece

For good milling results, little, if anything, can be done about the material in the workpiece, its physical and metallurgical characteristics. But much can and must be done about holding and handling. Judgment, based on experience, is necessary for proficiency in the art of properly, adequately and securely holding the job.

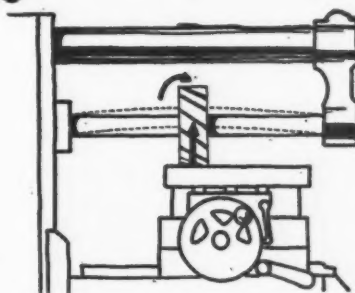
More advanced is the consideration of the problem of holding as related to the problem of handling.

RIGHT



The closer the table is to the column face, the more rigid and stable the machine while the cutter is engaging the workpiece.

WRONG



An unsupported arbor will spring when the cutter engages the workpiece.

FIG. 61—Right and wrong methods of setting up the workpiece in relation to the column of the machine, and of supporting the arbor.

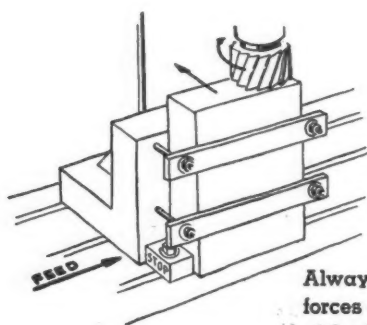
When no change in the method of holding is possible, and only a reduction in the cutting time can be effected with the application of carbide, the easy assumption is that carbide conversion is not worthwhile—or at least of little benefit. While the benefits may be reduced to as low as 10 pct of the man-hours saved, although usually not less than 25 pct is saved, such economies are still, obviously, worth while.

A little ingenuity will reduce the handling time while carbide takes care of the cutting cycle. Magnetic chucks, air vises, hydraulic clamps and other ingenious and quick acting mechanical hold-

for making his proposal, assuming also that the working dimensions of the machine are also known. This is a profound revolution in the world of metal removal.

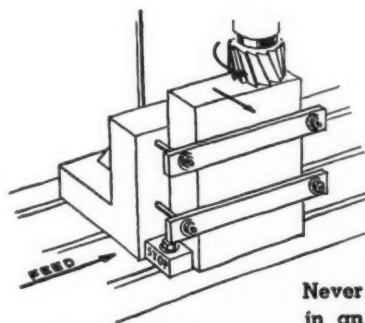
Proper Grinding

Finally, all milling practice, however good otherwise, may be nullified completely by poor grinding. Carbides require special attention, although the difficulties of this technique have been exaggerated. Commonsense and judgment, as in every other department, are essential. The following observations will also help:



RIGHT

Always direct the cutting forces against the solid part of the fixture and a supported part of the workpiece where they can be absorbed easily.



WRONG

Never direct the cutting forces in an operation against an unsupported portion of the workpiece or fixture as they cannot be counteracted properly.

FIG. 62—The direction of cutter rotation should always be toward the most rigid part of the fixture, never against the clamp or the movable jaw of a vise.

ing equipment are available in standard form that can be quickly and easily adapted to a particular job and set of circumstances.

As stated previously, the only limitation in the rate of metal removal is the number of cubic inches that can be removed from the workpiece and yet hold to surface condition and tolerance specifications. In other words, the job alone need now be studied as regards its cross-sectional areas and the facility with which it can be adequately and economically held, to determine its justifiable rate of metal removal. No fixed rules for these rates can be set down; only experience and good metal removal judgment will suffice. All this assumes that adequate spindle power in properly designed carbide machines is available.

Once the metal removal rate is determined in terms of the nature and kind of workpiece, the machine tool builder has all the necessary information

(1) Use only a diamond wheel, of good make with a resinoid bond for the grinding of carbide blades used in milling steel, cast iron or the nonferrous materials.

(2) Use the recommended wheel wet. A wick with kerosene or its equivalent, of which there are many commercial forms, dripping such a solvent on the periphery of the wheel will prevent loading. This prevents undue friction and resultant overheating.

(3) Use a small surface grinder for the grinding of solid carbide blades in a grinding jig.

(4) Take small depths of cut per pass of the diamond wheel, not to exceed 0.0005 in.

(5) Use the periphery of the wheel, thus presenting a line contact to the carbide blade, and not a surface contact as when the flat surface is used.

Part 11 of this series on carbide milling will appear in a forthcoming issue.—Ed.

Side-Blown Converter Practice

DETAILED records of side-blown converter heats, collected by the committee on Steel Castings Research of the Iron & Steel Institute, from plants of varying design and operating technique, are discussed in the article "First Report of the Side-Blown Converter Subcommittee of the Steel Castings Research Committee," in the January issue of the *Journal of the Iron & Steel Institute* (England). The records were studied with regard to the composition of metal and slag at various stages of the blow, the temperature increment during the blow, the composition of the exit

gas, the effect of variation in tuyere area, the metal loss during blowing, and the quality of the steel as judged by the content of the exit gases.

There appears, according to the report, to be a marked similarity between the acid side-blown converter process and the acid openhearth process in that the reactions are mainly between metal and slag, and the resulting steels have similar properties. A calculated heat balance also shows good comparison with that of the openhearth process as regards thermal efficiency.

Washington Steel

Starts Sendzimir Mill

Despite earlier skepticism the new mill proves capable of rolling stainless steel to extra thin gages and widths up to 36 in., holding finish and gage consistently throughout the coil. Company expects to produce about 1500 tons of extra light gage stainless monthly.

o o o

THE Sendzimir cold-rolling mill of Washington Steel Corp., Washington, Pa., went into production on Apr. 18, when the first coil of stainless was rolled to commercial quality and shipped. During the one-year delay in obtaining the mill, the company has done considerable sheet polishing and stretcher leveling for other stainless sheet producers.

The mill was dedicated on Apr. 18, and on Apr. 20

before trade and newspapermen it was demonstrated. Despite skepticism in some quarters, early experiments on the mill prove that in rolling to extra thin gages and widths up to 36 in., both finish and gage can be held consistently throughout the coil.

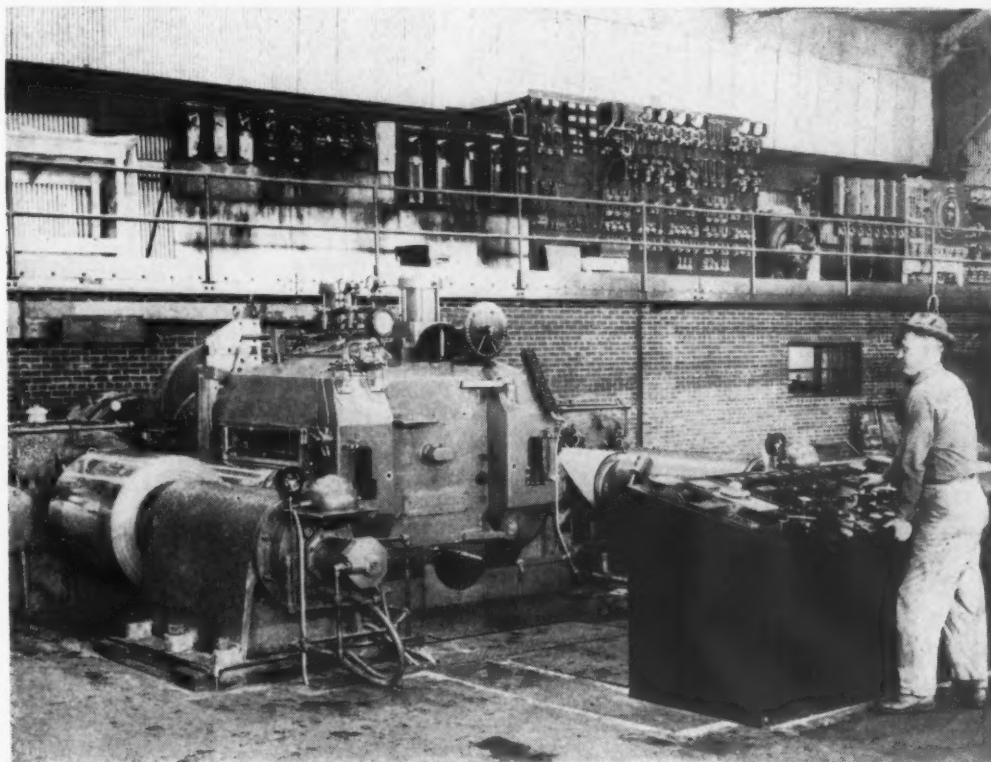
It is anticipated by Thomas S. Fitch, president of the company, that on three-shift operation with employment running about 150, the mill will be able to produce some 1500 tons of extra light gage stainless sheet per month. Starting with coils about 300 ft long, it is expected that 20 to 24 such coils can be reduced and processed daily. The rolling capacity of the mill will be devoted primarily to the production of continuously cold rolled stainless sheet and strip in thicknesses from 0.004 to 0.078 in., and widths up to 36 in.

Being the widest such mill ever built, Washington Steel Corp., is in the unique position of being able to

o o o

FIG. 1—The Sendzimir cold rolling mill, keystone of the Washington Steel Corp.'s production line, showing pulpit, rolling mill operator, and electrical switch-board necessary for its operation. This photo shows the first coil of MicroRold stainless steel being rolled, which was suitable for commercial use and is being shipped to a manufacturer for fabrication.

o o o



roll to these gages in widths never before attained. The Washington mill is not the first Sendzimir mill to be placed in operation: there are several others throughout the United States and Europe. The American Rolling Mill Co., has a 19-in. mill at Middletown, Ohio, that will roll to 0.0008-in. and another company in the vicinity of Washington Steel is preparing to install a 19-in. mill later this year. The Armco mill will soon be transferred from Middletown to Butler, Pa.

Washington Steel Corp., at present is buying stainless steel slabs and having them converted to hot-rolled stock by one of the large steel companies. Washington then rolls this hot-rolled stock to desired thicknesses and gages. The bulk of the production anticipated for the immediate future will be in thicknesses in the commercial gages lighter than 24 gage, with the production of the ultra thin sheet expanding as the demand warrants.

The anticipated increase in demand for MicroRold, the Washington trade name for extremely thin sheet, will come from the aircraft, electrical, architectural and building, and railroad industries, and there is a likelihood of an expanding market in the packaging industry. While there has existed for some years a known demand for this thin material, it could not be produced. Consequently any accurate evaluation of the market, present or potential, is impossible at this time.

Replacement Cost Would Be \$450,000

The Sendzimir mill itself, which would cost about \$450,000 to replace at the present time, is a cluster type mill. Its design is such that the sheet between the 1½-in. tool steel work rolls is always in a bath of oil. The housing design and construction is such that rolling stresses and strains are equalized, thus reduc-

ing the possibility of failure of any specific part. Capable of rolling up to 400 fpm, the mill maintains very accurate cross sectional dimensions in the finished sheet. Hot-rolled stock coils 0.118 in. thick that had as much as 0.013 in. crown have been reduced by the mill to 0.018 in. in seven passes without intermediate anneal or pickle. The crown on the finished sheet ran less the 0.002 in.

Mill Is of the Reversing Type

The control table shows the operator mill conditions, such as gage variations from the continuous micrometer, roll pressure from the hydraulic screw-down, mill speed, and voltage and amperage. Being a reversing mill, there is no need for removing the coil from the mill until it is finished to desired gage. The mill is served by an overhead crane that handles the placement and removal of the coils at the mill.

The first operation started at the mill was a polishing machine for stainless sheet. Washington Steel Corp. did a great deal of sheet polishing during the past year while awaiting delivery of the Sendzimir mill. A 465-ft continuous annealing and pickling line, shears, slitters, stretcher leveler and a resquaring shears complete the equipment at the plant.

The Washington Steel Corp. plant is the plant of the Washington Tinplate Co., which went out of business some years ago. The idea of a company for rolling stainless sheet to ultra thin gages was conceived by T. S. Fitch during the early years of the war. After a period of organizational activity, the plant site was procured. It was hoped by the company that the Sendzimir mill would be in operation by the spring of 1946, but constant delays in the receipt of electrical equipment pushed the commencement of operations back a full year.

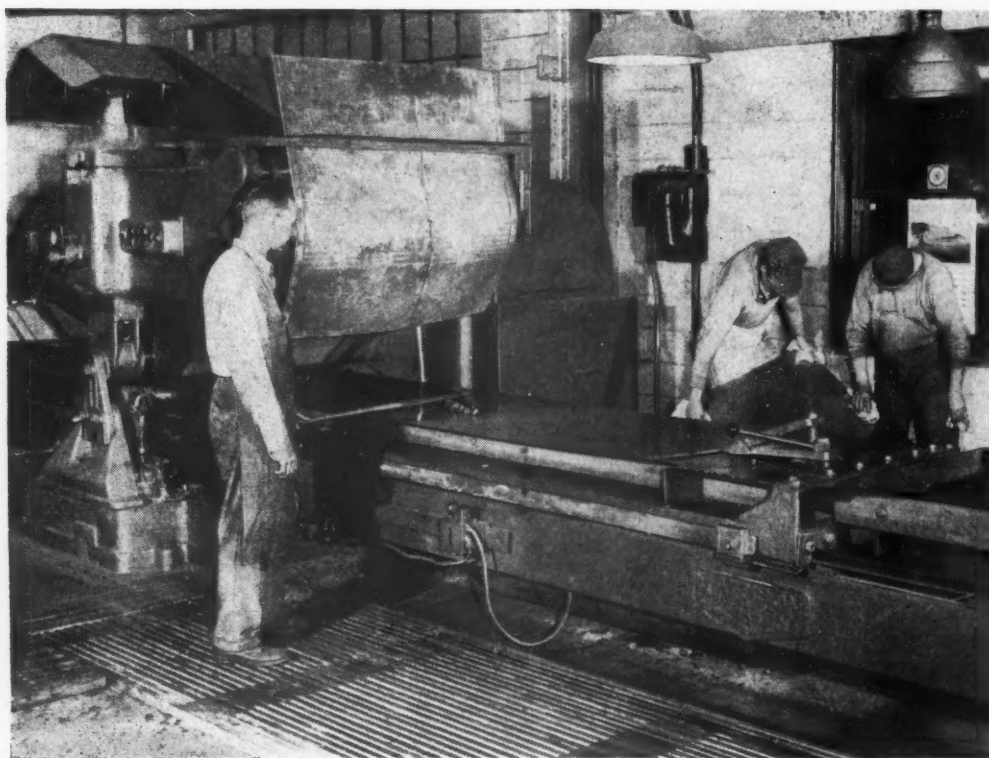


FIG. 2—A crew in the act of polishing and inspecting stainless steel sheet. The polisher shown was the first piece of equipment to go into operation.

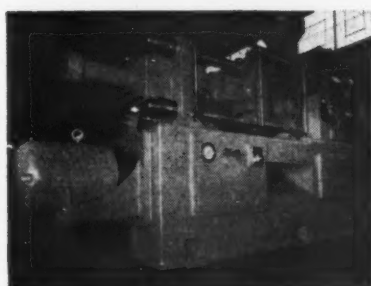
New Equipment...

An atmosphere generator, plastics molding press, die tryout press, corrosion resisting heat exchangers, screw-drum type washing and drying machine, and water soluble core binders are described in this week's review. Also discussed are lightweight portable conveyors, special arcwelding electrodes and machinery vibration pads.

Gas Producer

1 A gas producer for metallurgical processing, such as bright annealing and sintering, which generates a prepared atmosphere and removes sulfur compounds where manufactured gas is used, has been announced by the *Bellevue Industrial Furnace Co.* The atmosphere is produced through a partial burning of the gas, causing an exothermic reaction, and the air-gas ratio used to produce the desired atmosphere is set by means of the

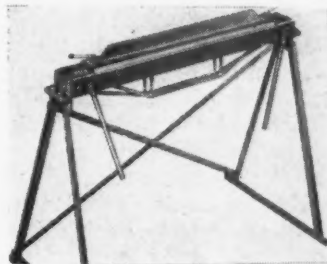
by the Hy-Jector, automatically and in uninterrupted sequence. Interlocked electronic controls and timers are adjustable to meet every



requirement. In addition to production speed, other advantages claimed for the machine are: Finished parts are consistently uniform in quality, free of blister, and porosity; by injecting material into a closed mold, flash is held to an absolute minimum; and close timing of the preheat-molding stage permits low molding pressures.

Sheet Metal Brake

3 Portable sheet metal brakes, available in 31 and 49-in. widths, and handling 20 gage material, are being manufactured by

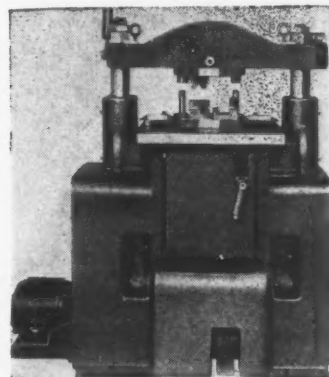


Webb Machine & Tool Co. The folding bar is controlled by case-hardened cams resting on leveling washers that permit even distribution of pressure, it is said. Cams are operated with flip of finger tips, folding bar raises automatically

when pressure is relieved and can be completely removed for bends that cannot be made with fixed bars. Bends up to 150°, including the Pittsburgh bend, are made. Pan boxes up to 1¾ in. are also produced, without any special adjustment. Both models come equipped with a detachable stand.

Die Tryout Press

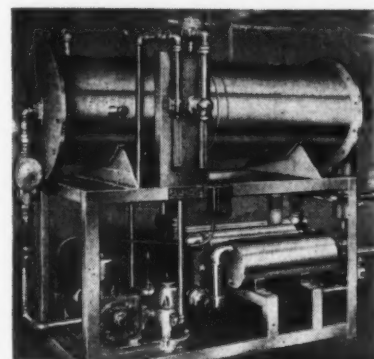
4 A press, the Alpha model 40, has been designed to try dies under production conditions, making finishing easier, faster and



more accurate, according to the manufacturer, the *Alpha Tool Works*. This press, which may also be used for production work, is said to detect necessary corrections. It is also stated that necessary finishing work can be performed on both male and female members without removing them from the press. Specifications are as follows: Capacity, 40 tons; stroke, 3¾ in.; strokes per min, 100; maximum shut height, 8 in; minimum shut height, 6 in; clearance between columns, 27 in.

Heat Exchangers

5 Production of a corrosion resisting heat exchanger designed for heating or cooling small quantities of corrosive solutions over a wide temperature range, has been



micrometer adjusting valve of the gas mixing controller. The mixture is then passed through a fire check valve into the burner and burned within the primary and secondary combustion chambers. The atmosphere producer is available in sizes to generate 350, 650, 2000, 3500, 9000 and up to 60,000 cu ft per hr.

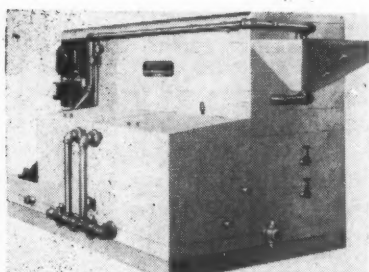
Plastics Molding Machine

2 Known as the Rockford Hy-Jector, an automatic molding machine for thermosetting plastics, developed by the *Rockford Machine Tool Co.*, performs on a single machine the conventional three-stage production sequence, with automatic time control of each stage in the cycle. The basic steps of making the preform, preheating, molding, and curing are all carried out

announced by the *Duriron Co., Inc.* First of a proposed line of heat exchangers of this type, the No. 4 size handling 4 to 14 gpm, has a heating capacity up to 155,000 Btu per hr with 75 lb steam and inlet temperature of liquid between 70° and 130°F, and a cooling capacity up to 90,000 Btu per hr, based upon 100°F mean temperature differential. Design features include separation of steam or coolant from the corrosive by a Duriron tube, vertical or horizontal installation, elimination of packing against corrosive solution, and removal of parts without disturbing steam or coolant inlet and outlet connections.

Screw-Drum Washer

6 For washing and drying metal parts, rinsing and drying them or any part of these operations, a screw-drum type machine has been

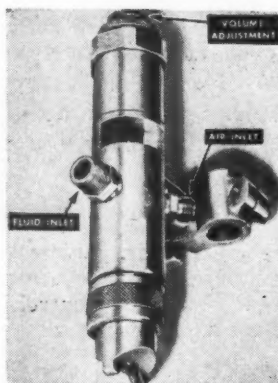


announced by the *Optimus Equipment Co.* The machine has been designed to handle difficult rinsing and drying jobs involving screw machine or small stamped parts, but can be adapted for a wash-drain, rinse-drain, cold or hot air dry sequence, or for pickling operations. The dryer end is completely closed to avoid air loss. The air stream passes through a heater and blower which provides for either a hot or cold air blast system.

Liquid Buffing Sprayer

7 An air-operated spray gun designed specifically for spraying liquid compounds on buffing wheels has been released by the *J. J. Siefen Co.* For operation with hand machines, the gun may be operated with a foot pedal and on automatic equipment, cam valve operation is recommended. Liquid buffing or satin finish compounds can be applied at about 35 to 40 lb air pres-

sure. Compound may be supplied to the gun through gravity feed or by air pressure, using a central



supply tank. The gun has been designed for use individually or in groups from a central air pressure supply tank.

Metal Cleaning Tank

8 A gas fired tank for cleaning metal parts in industrial, automotive plating and other plants has been manufactured by *D. C. Cooper Co.* The same tanks are also available equipped with steam coils where steam heating is desired. The sturdy construction of every part of the tank is said to make possible its use in cleaning of the largest and smallest parts, such as transmissions, motor blocks, tractor parts, brake drums, carburetors, tools, nuts and bolts. It is said that parts are so thoroughly cleaned that defects can be readily detected in the metal. The tank may also be used for quickly stripping paints, baked enamel and lacquers from steel and iron parts. The unit is equipped with 4-in. heating pipes in the bottom of the tank. Fumes are removed through a duct which extends the length of two sides and the back of tank, to which an exhaust fan can be connected. Tanks come complete with thermometer, drain, overflow connections, and can be equipped with an automatic agitating device.

Plastic Dip Coating

9 For protecting process equipment such as pipe, valves, fans, rotors and other intricately shaped equipment, the *U. S. Stoneware Co.* has developed Tygoflex, a liquid

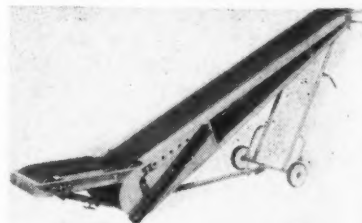
Tygon formulation consisting of 100 pct solids, which may be applied by dipping, spraying or brushing. The material can be applied to any surface or material which will withstand the time and temperature involved in the fusion, such as metals, ceramics, glass and heat resistant plastics. When subjected to heat for a short period of time, the coating converts to a thick, protective insulator resembling a glossy black rubber compound of medium hardness. Thickness from 1/16 to 1/4 in. can be built up in a single dip. The product possesses the same corrosion resistant properties as the basic Tygons and is resistant to all mineral acids, alkalies, salts, oxidizing agents, and a limited range of solvents.

Conveyor Switch Curve

10 Developed as an accessory for conveyor systems to direct flow of materials through to two possible destinations, the Y switch curve made by the *Rapids-Standard Co. Inc.* allows packages to be sorted and routed separately to designated areas for either storage or shipment. Essentially, the unit is a modification of the spur curve previously introduced and has been designed to permit greater flexibility with Rapid-Wheel gravity conveyor handling installations. The lines of this unit curve 45° in opposite directions.

Power Belt Conveyor

11 Development of a lightweight portable power belt conveyor available with a cleated belt for handling small parts, stampings, or bulk material has been announced



by *Arrow Products, Inc.* Known as the Ele-Veyor, the unit may be equipped with a wire mesh belt and run at reduced speed for handling small, hot forgings, allowing them to cool on the belt. Two basic lengths and widths are available; 6 ft with an 8-in. belt and 8 ft

NEW EQUIPMENT

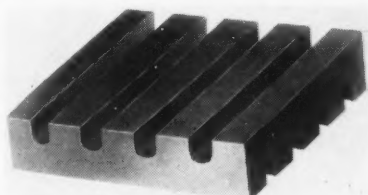
with a 12-in. belt. Conveyor length may be increased by bolting on extensions of 1, 2, 3 and 4 ft each. Drive is effected by V belt from $\frac{1}{8}$, $\frac{1}{2}$, or $\frac{3}{4}$ hp motor to first reduction, and chain driven through second and third reductions. Two adjustable compression springs give initial driving traction which is automatically increased as load weight increases. Capacity of both models is 300 to 600 lb.

Industrial Wheels

12 Lightweight industrial wheels, ranging in size from 6 to 12 in. and in load rating from 480 to 1200 lb has been offered by *Thermoid Co.* The wheel is made of a tough, lightweight aluminum alloy casting with oversized ball bearings and built-in grease seals. The rubber tread is smooth, cut resistant and quiet in operation. Sizes are 6, 8, 9, 10 and 12 in.

Vibration Pad

13 An oil-resistant ribbed Neoprene pad, known as the Iso-mode pad, has been developed by the *MB Manufacturing Co., Inc.*, for use under all types of machinery as a mounting pad and vibra-

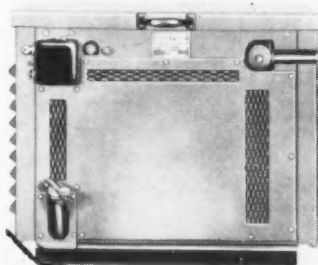


tion absorber. Standard pads which are 18 in. sq x 5/16 in. thick have been designed to reduce the cost

and time required for installing or removing machinery by eliminating the need for hold down bolts, skids, concrete mats or grouting. Machinery may be relocated whenever the need arises, permitting rearrangement of production lines in a matter of hours. The pads act as self-adjusting shims where uneven floor conditions exist. It is said heavy punch presses can be installed on standard factory floors with a single thickness of pad material.

Lift Truck Power Unit

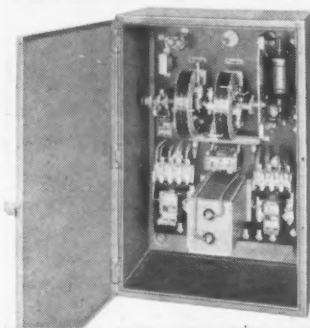
14 Gas-electric drive is available to users of motorized hand lift trucks through a new power unit, designated Model Z-12, recently in-



troduced by *The Ready-Power Co.* Operating speed may be adjusted to suit plant working conditions and loads. "Walking speed control" gives three speeds that are independent of the control mechanism of the truck. Battery-operated trucks may be converted by making slight alterations to the truck chassis. The unit, housed in a steel enclosure and powered by a 4-cylinder self-starting gasoline engine, weighs 600 lb.

Gun Welder Timer

15 Identified as Class 9052, Type FG, an automatic timer recently introduced by the Industrial Controller Div., *Square D Co.*, is designed specifically for gun welder



application in sheet metal fabrication where production line techniques are applied. The timer is composed of a synchronous motor-driven cam shaft, two control relays, low voltage transformer, and a capacitor braking circuit consisting of a large condenser, reactor and resistor. A feature known as squeeze delay is incorporated in the unit which makes the squeeze time for the first and succeeding welds independently adjustable.

Stainless Steel Electrodes

16 A complete line of stainless steel electrodes in a full range of grades and diameters has been announced by *Wilson Welders & Metals Co. Inc.* The stainless steel electrodes are furnished with a heavy extruded lime type coating for dc application. In addition all but the straight chrome analyses

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are obtainable with a lime-titania type coating which is usable on ac or dc. The slag produced by either of these coatings is said to be easily removed.

Hard Surfacing Electrode

17 Hardalloy is a dc reverse polarity arcwelding electrode that provides weld metal which is highly resistant to impact or abrasive wear in hard surfacing applications. It has been developed by the McKay Co. The weld metal as deposited tests 59 Rc hardness and is capable of being heat treated for machining or grinding, and subsequently re-heat treated to restore it to its as-deposited hardness. The weld metal is said to fuse readily with the base metal providing a sound, porosity free alloy for hard-surface applications. It is available in five sizes from 3/32 to 1/4 in.

Steel Welding Electrode

18 For welding low alloy cast steel or low alloy high tensile strength rolled steels in all positions, with ac or dc reverse polarity, the ACP-MO electrode, available in four diameters from 3/32 to 3/16 in. has been announced by the Westinghouse Electric Corp. ACP-MO should be used for vertical or overhead welding although it is said to produce equally satisfactory results in making horizontal fillet and flat position welds.

Auger Bit Set

19 An auger bit set for wood-boring which utilizes one auger bit with a number of interchangeable boring heads of various sizes,

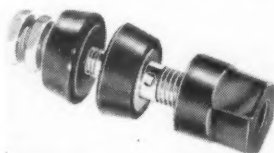
has been developed by Bruno Tools Co. Heads are changed without removing the bit by loosening a set screw, removing head and locking another head in place. Heads are said to lock securely with a positive-seal precision fit and set screw acts as a safety lock. Extra long cutting edge of the boring head and



specially designed lead screw is said to pull the tool through the wood, requiring no forward pressure and eliminating binding or clogging from conventional flutes. The set consists of an 8 1/4-in. shank with a choice of two groups of heads: 6 in sizes from 5/8 to 1 1/4 in. graduated by eighths, or 11 covering the same range but graduated by sixteenths.

Electrical Connector

20 A binding post, type DF30, offering five ways of connecting leads, has been announced by Superior Electric Co. The five con-



nections are: Permanent clamping of wire up to size No. 12 through the center hole; looping of wire around the center shaft and clamping; plug-in connection of a standard 3/4-in. center banana

plug; clip-lead connection by removing the hexagonal shaped phenolic head; and spade lug connection. The binding post is said to provide complete insulation of the post from the mounting panel. All metallic components are recessed assuring a dead front for instrument and user protection. The current carrying capacity is 30 amp.

General Purpose Motor

21 A general purpose universal motor, rated 1/10 hp at 5000 rpm, ac-dc, has been built by the L & R Mfg. Co. The unit features a spindle with 3/8 in. shaft extending in both directions and double shielded ball bearings. The motor, having OD of 3 1/4 in., is mounted on a pedestal and is supplied with a three-step pulley, foot rheostat and reversing switch.

Nylon Cable

22 Designed for industrial application, for the transportation field, or for use in manufacturing industries where a light, strong cable is desired, the Danielson Mfg. Co. has marketed Danco nylon cable, a product developed jointly with E. I. du Pont de Nemours Co. Tested on 1-in. pulleys and guides, the cable withstands 320,000 flexings before the steel core breaks and 410,000 flexings before the nylon covering severs. The cable is highly resistant to oils, acids, moisture, salt water, friction and fire and does not rust or rot. At the present time it is available in 3/16 and 7/32-in. OD sizes, both of which have a 3/32 in. aero steel wire rope core of 920 lb break test, over which the coating is extruded.

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5

REVERE METALS

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Here is an example of the manner in which the wide variety of Revere Metals permits exact specification. In the manufacture of this lock *five* Revere Metals are employed. Here they are:

1. 70-30 Cartridge Brass for the dial flange
2. Commercial Bronze, 90%, for case, case lid and bolt
3. Heavy Leaded Brass for tumbler parts and other items, including dial, requiring exceptionally accurate machining
4. Free Cutting Brass in Rod and Extruded Shape, for the machined and knurled head, and for the angle bar
5. Forging Rod, for the tumbler driver

Selection and employment of these metals enabled the manufacturer to meet the many different requirements of fabrication methods, and at the same time assure strength, long life and reliable operation. Revere Metals perhaps can do as much for your own product. For cooperation in the choice and use of these metals, ask about the Revere Technical Advisory Service. Revere supplies mill products as follows: *Copper and Copper Alloys*: Sheet and Plate, Roll and Strip, Rod and Bar, Tube and Pipe, Extruded Shapes, Forgings — *Aluminum Alloys*: Tube, Extruded Shapes, Forgings — *Magnesium Alloys*: Sheet and Plate, Rod and Bar, Tube, Extruded Shapes, Forgings.

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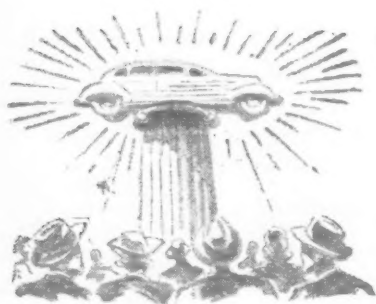


Mosler combination lock, most of its parts fabricated of Revere Metals. Made by The Mosler Lock Company, Covington, Ky., the lock manufacturing division of The Mosler Safe Company, largest builders of safes and vaults in the world.

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WALTER G. PATTON

• GM delivers first of 1500 new Greyhound coaches . . . The GM wage settlement with UE-CIO looks like the 1947 pattern . . . Ford and FAA move toward a showdown.



DETROIT — Delivery of the first of 1500 "Silversides" buses which will eventually replace one-third of the Greyhound fleet has just been completed by General Motors Truck & Coach Div. of GMC, Pontiac. Utilizing a new assembly line that is now nearly complete it is expected that production of the new type buses will hit 6 a day in the near future.

This is said to be the largest order for intercity buses ever placed, aggregating \$37 million.

The new GM buses weigh approximately 20,000 lb ready to go and considerable weight saving has been effected in the latest design by the liberal use of aluminum. Except for a small amount of trim on the front door, little stainless steel has been used.

For the most part, riveted rather than welded construction has been used. The new buses seat 37 passengers instead of 41 persons accommodated by prewar types. As a result of improved interior rearrangements, passenger comfort, particularly from the standpoint of leg room, has been much improved. Seats are adjustable for 4 different positions. New beam reading lights, individually controlled, are used. Head room has been increased and a specially

engineered heater, designed by Tropic Aire Corp. of Chicago in cooperation with GM engineers, gives passengers the benefit of a highly efficient air conditioning and ventilating system.

Heat resistant glass that reduces glare and heat from the sun has been specified for the windows that are doubled glazed to insulate against extremes of temperature. The new type windows also insure more efficient operation of the air conditioning system.

Many engineering improvements have been incorporated in the new buses although the major engineering change is probably that of boosting the horsepower of the diesel engines from 165 to 220 to provide greater reserve power and enable buses to maintain faster schedules over mountains or in hilly country.

This has been accomplished using a method GM engineers discovered during the war. That is to say, using the same size engine as was used prewar, the new diesel power plants have been stepped up from 165 to 220 hp merely by changing the injector from a "60" injector to an "80" injector and enlarging slightly the cylinder exhaust ports. (The figures indicate millimeters of liquid fuel metered to the engine.) Spectacular engineering advances like these are one of the reasons why GM showed in its latest annual report that commercial sales of GM diesel engines have quadrupled since 1941.

THE new buses also feature a new light-reflecting material called "Scotchlite" that reflects headlights $\frac{1}{4}$ mile away and will even reflect moonlight to an appreciable extent. Sprayed on the backs of the rear view mirrors at the front of the bus, Scotchlite reflects headlights of oncoming cars and indicates clearly the available clearance to the approaching motorist. This light-reflectant is also used on the lettering and the Greyhound dog at the side of the bus and has been applied as trim at the rear of the bus, so that its advertising value as well as its safety value have been put to work.

The 1500 new buses will be delivered to all parts of the country in approximate proportion to the number of buses now operating in that territory.

By the time this column appears, General Motors and the UAW-CIO may have agreed to a wage settlement on the basis of a 15¢ pay boost, since the U. S. Steel Corp. and the union reached a settlement on approximately the same basis.

A great deal depends on whether or not Walter Reuther knew in advance of the UE-CIO settlement with GM for 15¢. Mr. Reuther insists he knew nothing about the GM settlement until he was informed by New York newspaper reporters. Other sources insist, however, that Mr. Reuther was given a preview of the UE-CIO plans and that the UAW-CIO was not given the "double cross" this time, a charge that Mr. Reuther made last year when UE settled with GM while the UAW strike was in progress.

While the UAW executive board has announced with understandable unanimity that the union is holding out for the original demand of 23½¢, all indications point to the fact that the 15¢ hike would turn out to be the 1947 formula.

The argument for this conclusion runs something like this: Past experience has shown that when Mr. Reuther asks 23¢ he probably has in mind that a settlement somewhere in the vicinity of 18¢ will be necessary. He already has virtually 15 of these 18¢ in hand. Therefore, to pull out GM workers, already weary from last year's siege of 3 months, would be anything but popular with workers who already feel they had to carry the load for the entire industry last year. In addition, the union treasury is anything but prepared for a long strike.

THE rapidity with which the GM wage settlement has come about is surprising to most observers here. In rapid succession, GM offered a 10¢ "temporary" hourly raise to its CIO affiliated employees. Two days later it was

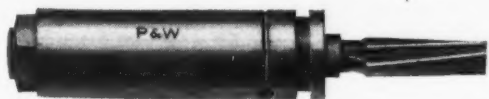
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announced that the UE-CIO workers had agreed to an approximate 15¢ hourly raise. After two days of negotiations the union's top officers left for Pittsburgh for a conference with CIO President Phillip Murray.

If the CIO conference does not agree to the 15¢ settlement, thereby letting Mr. Reuther back down gracefully from his 23½¢ wage demand and thereby avoid a GM tieup this year, most sources here will be very much surprised.

Meanwhile, it is beginning to

men more effectively a part of management than before.

FAA filed a strike notice last summer and negotiations have been going on intermittently since that time with no indications of success. The contract runs out on May 9.

IN announcing its decision to terminate its FAA contract Ford minced no words: "It is our conclusion that the results (of the contract) have been the opposite of what we had hoped for.

small. All Ford foremen are salaried employees, incidentally.

Whether or not a strike will be called appears to depend largely on the possible effect a strike may have on anti-foremen legislation now pending in Congress. The differences between the two parties appear to be deep enough to result in a strike if the legislative threat did not have to be considered.

Willys-Overland Motors Will Start Output Soon In New Stamping Shop

Toledo

••• Within 30 days Willys-Overland Motors, Inc., will begin production in a new \$5 million stamping shop which will use 15,000 tons of sheet steel a month, according to William E. Paris, vice-president in charge of operations. The shop is scheduled for completion within 90 days and 25 of 53 presses up to 1400-ton capacity have already been installed, a company spokesman said.

Work on the new stamping shop was begun last July in a building covering 135,000 sq ft. In order to install the presses it became necessary to elevate the roof 12 ft and install a concrete and steel pit 700 ft long and 20 ft deep.

The largest of the new Willys-Overland presses weighs 300 tons and will produce roof panels, fenders, hoods and other stampings slated to be used in the new Willys passenger car. In addition, the presses will be utilized for scheduled to go into production jeep truck line which is soon stampings for the company's

Willys-Overland is also planning a new die shop.

J & L Expands Tube Plant

Pittsburgh

••• In order to have on hand ample supplies of raw materials to insure continuous operation of its Electricweld Tube plant in Oil City, Pa., and render prompt service to old and new customers, Jones & Laughlin Steel Corp. is erecting an addition to its present strip storage building.

The addition will add about 5000 sq ft of floor space to the present building and practically double the strip storage capacity.



1499 MORE LIKE THIS: Pictured here is the first of 1500 new coaches GM Truck and Coach Div. is delivering to Greyhound Lines. Eventually one-third of the Greyhound fleet will be replaced by the new models. Aluminum construction, many changes in the interest of improved comfort for passengers, and a power plant stepped up from 165 to 220 hp are featured in the new coaches.

look like the first major strike of 1947 may occur at Ford where a long series of incidents was recently climaxed by the firing of a foreman in the rolling mill. The foreman had taken time off without permission to attend a union meeting.

FAA accuses Ford of firing for union activity.

Ford has recently served notice that it will cancel its contract with the foreman's union and the union has given Ford similar notice.

The roots of the present controversy are deep, going back to May 1944 when Ford surprised the entire automobile industry by signing a foreman's contract with FAA. The explanation for the Ford move was that the company wanted to give organized labor every opportunity to make good and that FAA had convinced Ford management that the signing of a contract would make Ford fore-

We feel our association under the agreement has failed to meet the test. The association has tended to lead our foremen away from management responsibility and has in fact opposed efforts of the company in this direction."

Ford is insisting that the union check loitering by the workers and that foremen conduct themselves unequivocally as a part of management. The union's position is that foremen should supervise work only. (The union for instance refuses to police lunch wagons.) FAA is also demanding a union shop and the check-off. The union charges Ford with "raiding" or promoting general foremen to superintendents or engineers to avoid union affiliation.

Other differences between Ford and the union include disagreements over certain wage classifications and the union's claim that Ford pensions to foremen are too

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• **Truman likely to carry case for price reductions to individual industries . . . Legal moves not in prospect . . . Reduction in steel considered psychologically significant . . . High food prices glossed over.**



WASHINGTON—Few White House statements in recent months have evoked so much discussion as Mr. Truman's blunt declaration recently that prices are too high and must come down or else. The nub of the coffee-shop and off-stage conversation has been, of course, what did the President mean by his strongly implied "else"?

That "all things are to all men" has been aptly demonstrated in this instance. There has been read into the somewhat cryptic statements various Administration motives which range so far afield as the somewhat fantastic idea that it may have been a trial balloon presaging an attempt to revive a modified NRA. One school of thought interprets it as a gentle hint that for an indefinite period (until prices drop to a more normal level) the Justice Dept. would look with a tolerant eye on price-fixing aspects involved in a general or industry-wide price reduction.

Attorney General Tom Clark, however, quickly let it be known that there would be no laxity in enforcement of price-fixing conspiracies regardless of the direction in which such agreements tended to force them. Mr. Clark declares that

he knows of "no industry in which there is any need for competitors to get together in a combination to fix prices." In what may be a veiled warning to industry, Mr. Clark has further stated that normally any price-fixing arrangements are outside the law and as such would receive the prompt attention of the Department. He adds that he feels that any businessman who sees an advantage in lowering prices could "and should" be able to go ahead on his own without the necessity of resorting to wide agreements with others within the same field or industry.

The general opinion of the more reliable observers is that the President has no ulterior motive beyond a genuine worry concerning the continued uptrend of prices. He has seen price controls removed and he has generally been one jump ahead of the pack in suspending or removing one government control and restriction after the other. As a result, prices have soared as generally expected but have not settled back as many had predicted. In many fields, prices have been found way out of line in their normal relationship with prices of other commodities.

THE President's concern is primarily based on the complaints which have flooded the White House, Congress and government departments although the motivating force behind the President is believed to be Treasury Secretary John Snyder rather than John Steelman who customarily carries the ball for the White House on economic matters. Mr. Snyder has been vigorously opposed to all suggestions of tax cuts on the theory that they would release more buying power to push prices still higher. However, he does favor loosening consumer credit where supply balances are beginning to show.

He also has been reported as having been informally conferring with industrialists about the country. Lending support to this and the belief that he is directly tied in with any government price move is his statement that he expects a significant announcement on the price situation this week. It is an open secret that Commerce Dept. officials who have contact with busi-

ness firms or trade associations have been passed the word to talk and urge price reduction. The next step expected is for the President to call in small groups of industrialists to quietly talk over the situation.

Mr. Truman has made it perfectly clear that he has no power other than moral suasion with which to bring about a reduction of prices. Nevertheless, he is said to have all interested government departments at work looking for possible ways in which the government might act to help within existing laws.

The President feels that business wanted to be free of price and other governmental control and now, that this is virtually accomplished, it is essentially a problem of free enterprise. And unless something is done, and quickly, he says, another round of wage increases might be justifiably sought.

While the intent of throwing the Administration spotlight on the price situation was obviously to stir up buyer resistance and throw the fear of God into industry, it cannot at present toss too much weight onto the scales except as a last resort. The White House is against any highly organized consumer strikes. These would prove just as harmful in the long run as the upward spiral of prices; both would have the same disastrous effect of bringing on a drastic recession.

UNDER consideration are quiet requests for business to study the seriousness of the problem and use its best judgment as to what can be done—such as clearing out old stocks, promotion of clearance sales, reduction of prices on all items possible, and otherwise set its house in order.

Most of retailing is behind the price reduction move, possibly warned by such straws in the wind as the pre-Easter sales which were not too successful. The American Retail Federation, for instance, has called upon its members to shake the water out of specific areas of the price structure, item by item, and category by category.

There has been evidence that a price reduction trend inaugurated by industry on its own in a small way before the public expression of



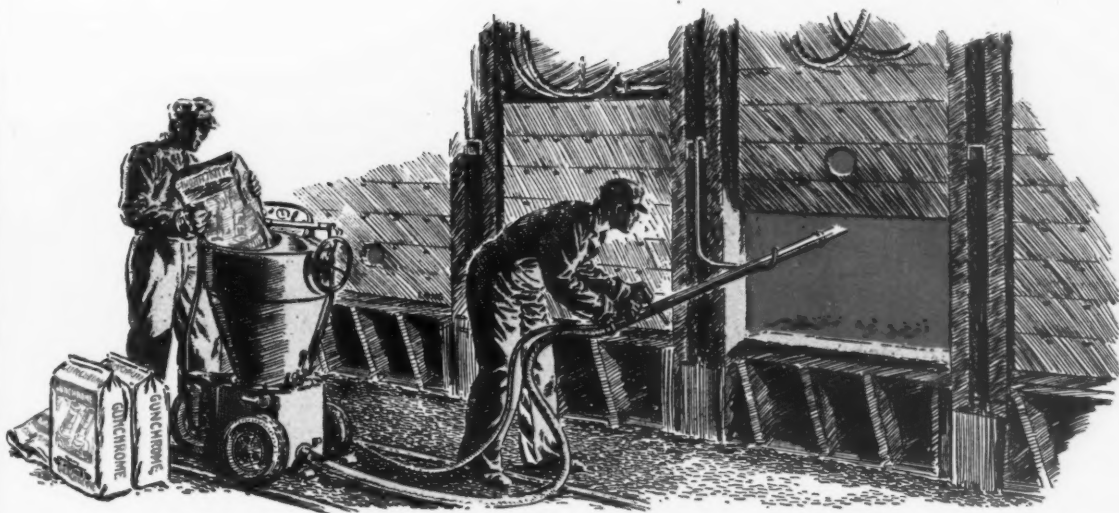
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THE IRON AGE, April 24, 1947—75

Administration concern has been accelerated. This has been more evident, however, in the retail than in production and manufacturing levels, despite the reductions announced by Ford, Plymouth, International Harvester, Carnegie-Illinois, and some smaller firms such as Buffalo Forge Co.

Henry Ford, 2nd, and Fowler McCormick of International Harvester have been listed among a number of business leaders who have been asked to appear before the Congress' Joint Committee on the Economic Report to testify on the price situation. Senator Taft (R-Ohio) said these two were particularly invited because they had announced price cuts within their companies. In addition, other business men and groups will be asked by the Committee to prepare answers to detailed questionnaires as to their views on prices and how to reduce them.

Retailers in recent weeks have been reported as shaving profit margins but not until following the Truman pronouncement has there been any marked trend. For instance, since that time there has been an increase in the number of larger department stores which have widely advertised reductions

of considerable percentages. When the counters and shelves have been sufficiently cleared, the way is open for a steady pressure to be exerted on the production and manufacturing levels.

ALTHOUGH government studies have shown that metals prices are not out of line in relation to others, prices of basic materials such as steel have been uppermost in many Washington minds. However, steel did not figure specifically in the price discussion at the recent Cabinet meeting. It is generally admitted that a price cut of as great an amount as \$3 or \$4 a ton in steel would have little bearing on the price of an automobile, a washing machine or other end products.

It is evident that a token reduction in steel prices would be welcomed, however, for its moral and psychological effect. Following the White House conference, Dr. Edwin Nourse, White House economic advisor, said that a cut in steel prices would help and that "such a cumulative effort could bring considerable benefits."

In the drive to force down prices, the one group which exerts the strongest pressure for inflation

seems to have been ignored or glossed over in most instances. Foodstuffs comprise the greatest single category involved in the cost of living of the average worker and obviously contributes the greatest pressure for more wages which account for the largest portion of production or manufacturing costs.

The government's own figures reveal that prices of farm products are the ones which not only have shown the greatest increase since 1939 but are the most out of line in the current price boom. More specifically, government figures to be released the latter part of April will show that prices of farm products as a group, as of Mar. 1, have increased by 179 pct over 1939 prices. Livestock and poultry as a product which furnishes the meat needed by the worker, will show an increase of 205 pct.

IN comparison, metals and metal products increased by only 48 pct despite an increase of 132 pct in prices of all raw materials. Price increases in other major groups include textiles, 103 pct; building materials, 95 pct; hides and leather, 87 pct; chemicals, 74 pct; house furnishings, 45 pct; and, fuels, 34 pct.

Despite these facts and figures, basic materials and manufactured articles for the consumer are the ones which come under the most frequent attack because of prices. At the same time, food is generally responsible for from 35 to 50 pct of the cost of living for the average worker's family and unfortunately this is one item in the family budget which cannot be reduced beyond a certain point.

It is admitted by the Administration that food prices are just as important as those of other commodities. Yet, the government works directly and with specific purpose to prevent prices of farm products, including cotton and wool for clothing, from going lower. It is done for many crops and under governmental policy written into law.

Therein lies a paradox of a government urging reduced prices with one hand and upholding them artificially with the other through use of subsidies to provide parity. The government is committed by law to continue most of this program until Jan. 1, 1949 and the 1948 budget calls for slightly more than \$100 million to keep food prices up.

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THE IRON AGE, April 24, 1947—77

• Portland area fabricates 7 million lb of aluminum per year . . . Labor unrest plagues Seattle industry . . . District IUMM & SW in convention bans Communist leaders.



PORTLAND, ORE.—In this immediate area where three aluminum reduction plants are producing approximately 400 million lb of aluminum ingots each year, approximately 7 million lb of aluminum are consumed annually in the production of a variety of commodities, according to a survey just completed for THE IRON AGE by Chester K. Sterrett, manager industrial department, Portland Chamber of Commerce.

Reynolds Metals Co. is producing approximately 140 million lb of aluminum ingots at Troutdale, Ore., and about 60 million lb at Longview, Wash.; and the Aluminum Co. of America is operating at a rated schedule of 182 million lb annually at Vancouver, Wash.

The survey conducted by Mr. Sterrett shows that of the aluminum consumption in this area annually, about 4 million lb is in the form of sheet stock, 2¼ million lb in the form of pig, and the remainder, extrusions and bar stock. A large percentage of the aluminum used locally for castings is secondary metals.

Although representatives of some of the aluminum fabricators contacted stated that use of aluminum will be replaced by steel when it

again becomes more plentiful, the future consumption in this area is expected to increase.

A large part of the aluminum processed in this area is used to fabricate: Irrigation equipment, refrigerators, hot water heaters, cooking utensils, clothes driers, shingles, truck and trailer bodies and machine parts, and a jointer. This latter woodworking machine is built almost entirely of aluminum and other metals are used only in the bearings, shafts and knives. The Barton Co. is operating on two shifts to supply the demand for this industrial equipment.

In addition to the consumption of aluminum as revealed in this survey, electric power companies are utilizing an impressive quantity in their transmission lines and the construction field is similarly using a large amount. Corrugated aluminum sheets are being used as siding and roofing material to a greater extent than ever before and the locally produced aluminum shingle is meeting with general approval.

An example of aluminum in local building construction is found in a 12-story office building now under construction in downtown Portland, where aluminum sheets are being used as a veneer surface for this concrete building.

Impetus to aluminum consumption in this area is anticipated in the event that Kaiser Co., Inc., is successful in obtaining a long term lease on the Swan Island Shipyards here where it has been reported this company expects to enter the production of aluminum garage doors, clothes driers and possibly bus bodies.

SEATTLE—Labor and its problems continue to be the principal subjects of discussion and worry on the part of industrialists in this area.

Commissioner Albin L. Peterson of the U. S. Conciliation Service, has been appointed as conciliator in the labor negotiations now in progress between the Boeing Aircraft Co. and Local 751, Aeronautical Mechanics' Union. This appointment follows the 30-day notice of intent to strike filed Apr.

7 by the union. The old contract ran until Mar. 16, 1947 and has been in effect and is expected to remain so until a new agreement is reached by negotiation or arbitration.

Mr. Peterson has met with company representatives and was scheduled to meet last week with C. L. Bentley, grand lodge representative of the IAM and officials of the local union. These meetings were to provide the background information on the issues involved and will be followed by joint meetings of all parties concerned.

Both sides of this negotiation have indicated that a strike will probably not ensue and this feeling is no doubt based on the past record since there have been no serious strikes and labor difficulties here in the past few years.

Mr. Peterson is also acting as conciliator in the negotiations between the Molders & Foundry Workers Union and the Washington Metal Trades.

Strenuous efforts to avert a walk-out of an estimated 30,000 workers in more than 100 metal fabricating plants are being made with Commissioner Harold R. Conn of the USCS meeting with representatives of the Machinists Union, Lodge 79, and the Washington Metal Trades, Inc. representing the employers.

He will also act as peacemaker in talks between employers and six American Federation of Labor unions, representing metal polishers, blacksmiths, boilermakers, warehousemen, iron workers and welders. The conciliation service hasn't stepped into these disputes as yet, since the negotiations have been carried on independently between the employer and employees. Nonetheless, Mr. Conn is familiarizing himself with the issues involved and is holding meetings with the United Steel Workers of America and the Northwest Metal Products, Inc. group where a strike is still in progress.

All negotiations are being watched very carefully because if any of these strikes materialize the metal working industry in this area will be brought to a standstill.

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SALT LAKE CITY—The bitter division in the CIO International Union of Mine, Mill & Smelter Workers over alleged Communist control at the top was not sweetened any at the 12th annual convention of district union No. 2 (Utah and Nevada) here last week.

The "righties" took control from the outset, although their margin of dominance was not large. J. Frank Marble, the district president, revived the ideological ruckus the day before the convention opened by announcing his resignation in "protest against Communist control of the international." He appointed as his successor another "rightest," George Wilde.

International officers and representatives sat at the back of the convention hall and were "given the privilege of speaking" by action of the convention. The delegates refused to send back to committee a report limiting Maurice E. Travis, Reid Robinson's successor as international president, to 25 minutes, though he was actually given more time.

The convention rejected (by ruling it out of order) a resolution designed to unseat delegates who had advocated secession from the international; adopted a resolution reaffirming in stronger language a ban on Communists holding office in the district union; and recommended that local unions establish a like policy. This latter action was taken in the face of flat declarations by Mr. Robinson and other international union spokesmen that it was in violation of the international constitution.

The union approved establishment of company-wide councils for

bargaining purposes for such operators as Kennecott, Anaconda, U. S. Smelting & Refining. Small unions would be grouped in miscellaneous council and district unions maintained to coordinate activities.

Such a council has been functioning for some years in negotiations with the American Smelting & Refining Co. A Kennecott council was recently organized and an Anaconda council is in process of organization.

Chief objectors to the plan are the small unions who fear the district union, which has conducted area bargaining, will be wiped out and that they will be left with badly weakened bargaining power. Advantage of the council setup, from the union standpoint, is that it will permit the application of pressure to all of a company's units at the same time.

On the sizzling hot secession issue, the convention adopted a resolution deferring action until the committee appointed by national CIO investigates and reports. A report would then be sent to each local union for whatever action the local membership deems advisable. Locals would report action, or lack of action, to the district union, whereupon the district union would take whatever action deemed necessary.

In effect the question of secession would be left to the locals. If most of the locals should secede the district union would probably follow suit.

LOS ANGELES—Shipbuilding, which grew to one of the major industries on the West Coast during World War II, is mak-

ing increasing use of alloy steels. In some of the later installations high-pressure steam piping and feed lines are operated at temperatures in excess of 750°F and 600 lb pressure. Carbon-molybdenum steels are used extensively in these applications. Not only the lines themselves, but valves, fittings, bolting material, etc., must be of alloy materials to stand up in this service. Valve trims such as seats, stems and discs are often made of stainless steel. Feed-pump casings are now being made of 18:8 grade due to the erosion caused by the water. Superheater tubes and headers operated at 900°F are of low carbon, 4 to 6 pct chrome, molybdenum steel. Castings for the turbines are made of carbon-molybdenum steel, and turbine rotor blades are made of stainless steel. Tail shafts and couplings on Navy vessels operating at 400 rpm utilize alloy steel, as do the coupling bolts for the main shaft and the joint bolts on the high-pressure turbines. Other parts such as reduction gears, where resistance to wear, pitting, and fatigue are essential, require the use of alloy steel.

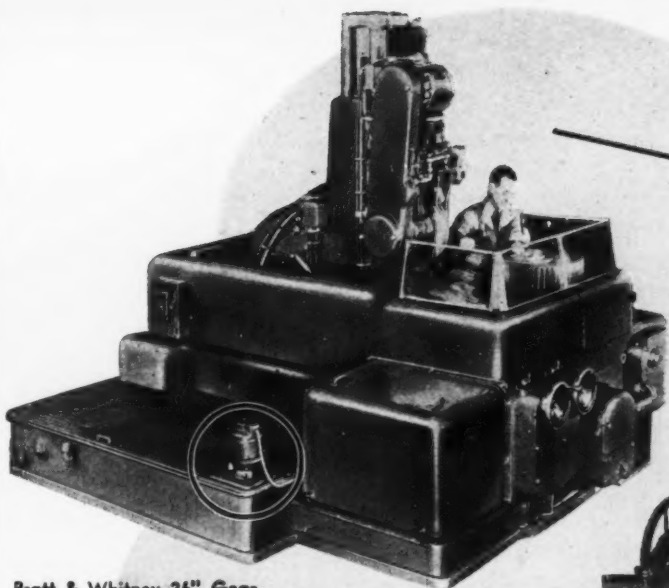
In the transportation field, the use of alloy steels is also expanding rapidly. The demand of fabricators for a stronger steel, to permit the use of lighter sections by increase of unit stresses has led to the development of the low-alloy, high-tensile steels. These steels have a minimum yield strength of 50,000 lb psi., compared with 33,000 lb min. for ASTM-A-7 steel, and five to six times greater resistance to corrosion. As the ratio for endurance limit is frequently over 70 pct of the tensile strength, a working range of 60 to 70 pct may be considered the normal expectancy for these steels, whereas for the ordinary structural steels 45 to 55 pct is generally used in determining the unit working stresses.

Due to the above properties these steels are being widely used in the construction of freight and passenger cars and other railroad equipment, in trolley cars, buses, trucks and trailers.

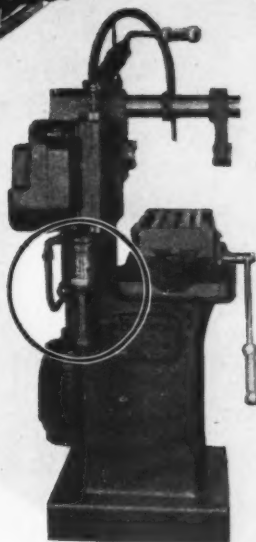
A new industry, the manufacture of fiber containers for milk and other dairy products, uses highly complex machinery which require large quantities of alloy and stainless material, both castings and fabricated parts.

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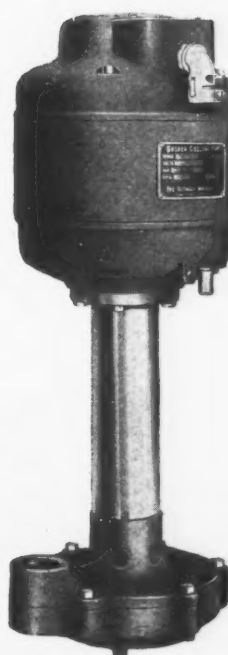
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European Letter

JACK R. HIGHT

• British steel industry operating at annual rate of 11 million tons per year . . . Coal production on upgrade . . . Additional solid fuel allocation to be granted.



LONDON—The pall that settled down over the British steel industry due to the national fuel shortage and transport disruption rests there. With the nationwide fuel allocation for steel at 75 pct of optimum requirements, the industry is limping along at an annual rate of about 11 million net tons per year, instead of the 15 million ton rate which was planned for the year. The government at this writing is trying to draw up a balance between the reduction of output in steel and the reduction of demand by curtailing production in steel consuming industries.

Until such a balance can be determined, no final decision on the allocation of coal to steel companies is expected. There are some sections of the cabinet which feel that today's 75 pct fuel allocation to steel is too high, but the Ministry of Supply is probably pressing for a slightly higher allocation.

The primary decision for the government to make, however, is to determine how far to gamble again on future production. It will be remembered that the fundamental cause of last winter's sudden fuel shortage in Britain was that the government planners gambled on a mild winter, and lost. Fuel stocks

were inadequate, and almost everyone suffered as a result. When this occurred, the government assumed a most penitential air, and all parties agreed that in the future there would be no gambling. A cautious stockpiling policy was to be followed during this summer which would be sufficient for the next winter, regardless of what might happen.

In the light of today's reduced industrial activity, there are those factions which are trying to forget those words of a few weeks ago.

Despite the experience of the past winter, there are people today who would assume that coal production is to be satisfactory in the next few months, and that industry will have sufficient supplies to operate at capacity. Those whose ideas are more cautious point to the fact that the miners will go on a 5-day week at the first of next month, and that there is no guarantee that production may not go down at that time. It is certainly true, however, that coal output is going up at the moment, and that if the present trend is continued the total tonnage for the year will be a heartening increase, even though it will not be sufficient to permit the exports which Britain requires.

FOR industry other than steel, the outlook is somewhat brighter this week. Due to the upturn in coal production, Sir Stafford Cripps has announced a general increase in the solid fuel allocation, with 112,000 tons more of coal going to industrial users each week. As previously reported, those non-essential industries were cut during the fuel shortage period to 33 pct of their normal supplies. The effect of this increase will be that non-essential industries will receive 50 pct of their requirements.

Whatever is left of the additional 112,000 tons of extra coal each week will be used by regional boards in the form of supplemental allocations to essential users. These arrangements are in general designed to carry British industry over from now until June 1. At that time the government hopes to have a new

fuel allocation system ready to determine how much fuel is to go into stockpiles, and how much is to go into current production.

The key dependence on coal supplies both here in Britain and on the Continent underline the regret with which the news of the American coal production stoppage was met here. France, Italy, and to a lesser extent other Continental countries are heavily dependent upon American exports. The possibility of American exports to Britain has also excited much comment in the newspapers since the fuel crisis here. It has been expected that any increase over the present level of American exports of coal would be for shipment to Britain.

Under these conditions, the stoppage in America, merely emphasized the current impression that American participation in European affairs is a transitory business, not to be depended upon in times of difficulty. From the standpoint of the steel industry, the blow was double-edged. It was hoped that exports of coal direct would improve the overall fuel situation, and that a continued high production rate might make it possible too for enlarged supplies of semis to be exported to England.

I HAVE spent considerable time in the past few days trying to discover, from the standpoint of the steel consumer, just what the decrease in steel output means. It is a complicated question, possibly because the allocations are on a basis that is difficult to understand. The steel industry has been trying since the first of the year to sell the idea that there is no steel shortage, and that there will not be one for the remainder of the year. On the other hand there are many current stories that potential steel consumers are only getting 25 pct or 33 pct of their requirements.

It seems certain that in the case of many light engineering industries, the allocations are far below normal. For heavier industries, it seems that they have been doing rather better. But to get down to



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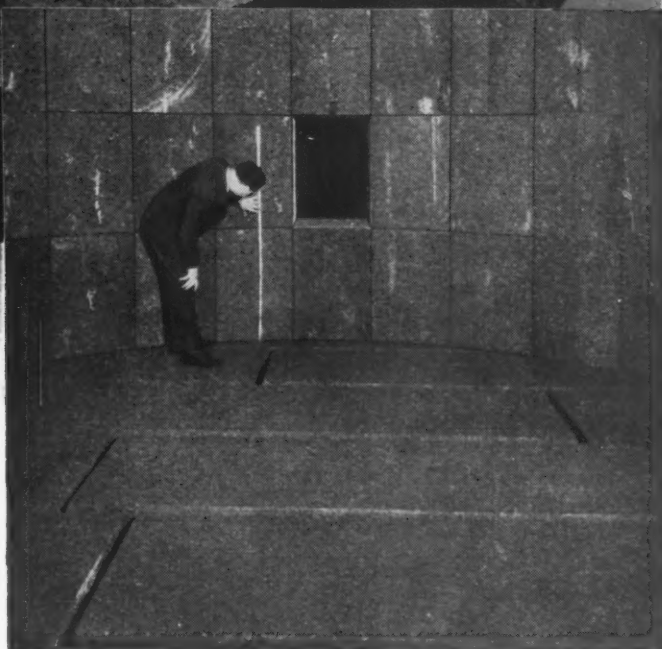
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a truly enlightening quantitative analysis of the relative need and allocations in each line is virtually impossible. One reason that the government is having so much trouble in allocating steel is that the system of presenting requirements is so complicated.

At present, several government departments, the Ministry of Supply, the Board of Trade, the Ministry of Works, the Ministry of Transport, and others, all present their "needs." From the standpoint of the Cabinet secretariat, which is the final authority, no one knows exactly where the steel goes, except to these general governmental departments. I thought at one stage of the game that it would be fairly simple to canvass each department, and find out what their various requirements were.

I HOPED thus to get a general steel consumption table. I discovered, however, that the complications were almost eternal. The Ministry of Agriculture only has a general idea of the requirements for agriculture. The Ministry of Health, which is nominally responsible for the government's big housing program, only has a small

portion of the steel housing responsibility. The Board of Trade has a general responsibility over the entire export program, and a specific responsibility over particular industries. The Ministry of Supply has a general responsibility for the engineering industry, but does not authorize all the steel required.

In short, the administrative pattern is so complicated that the overall application of reductions is a very difficult one. When it becomes necessary to cut steel consumption by 25 pct, the figures from each of the departments must be utilized. No one knows for sure that when two different departments describe a need as "absolutely essential" that the relative urgency is anywhere near the same.

It seems obvious that some system of interdepartmental supervision of steel priorities requirements is indicated. The problem is much deeper. The new urgent steel priorities (they were established as THE IRON AGE predicted, Apr 10, p. 104) cannot be applied alone. There is no merit in establishing steel priorities for an industry which needs timber—also critically short in Britain—as well, un-

less priority for the supply of timber can be also arranged.

Although a new central planning authority is being set up, it has not yet been made clear that there will be a central review of steel requirements reducing departmental requirements to a common denominator, and then coordinating steel demands with the priorities with all other materials which are in short supply. At the moment it is being conducted largely on the basis of a wholesale lobbying exercise. Whichever governmental department can do the most efficient job of selling the Cabinet on their personal needs, gets the most steel.

Thus late last year the automotive industry felt that it was being imposed upon. Now, due to the overall shortage of light plates which I have mentioned before, the shipbuilding industry is getting the full brunt of the shortage. Latest reports are that the shortage will result in a 30 pct cut for the shipbuilding trade. There are mixed opinions on the result of this cut. Some yards are being controlled by the steel picture, while others are more concerned about the labor supply than they are about steel.

Summary of United Kingdom Steel Statistics

Source: British Iron & Steel Federation

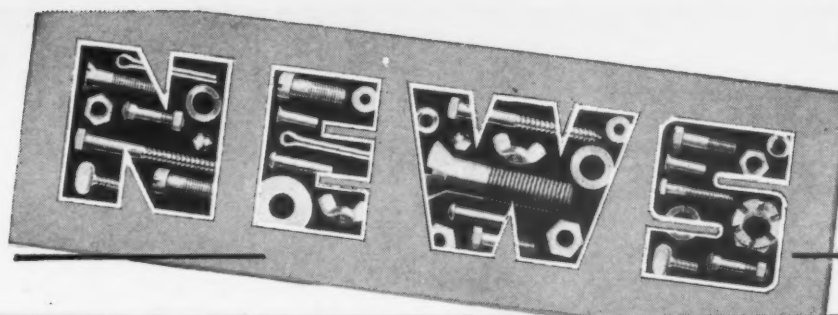
All Figures Thousands of Net Tons	STEEL			PIG IRON	SCRAP	IRON ORE	
	Ingot and Castings	Finished Deliveries	Steel Stock (1)	Production (2)	Steelmaking Consumption	Imported Ore Consumption	Home Production
1944 Total	13599.0	11502.4	2431.5	7542.0	8252.6	2725.6	17332.2
1945 Total	13237.8	9992.3	1885.9	7959.4	8065.9	4494.7	15870.4
1946 Total	13958.0	11154.3	1332.4	8689.6	8562.6	6718.2	13661.2
1946 January	1025.0	971.0	1370.9	803.6	754.8	541.5	1373.6
February	1107.5	833.2	1341.5	654.5	657.2	445.5	1147.3
March	1145.5	898.6	1314.7	659.9	695.2	484.2	1148.6
April	1129.4	827.0	1265.1	666.1	682.7	499.0	1090.8
May	1466.0	1139.0	1283.6	846.7	890.9	644.5	1371.4
June	1074.3	859.2	1266.3	678.7	640.1	531.7	1010.2
July	1012.9	791.1	1299.8	658.5	616.0	534.9	986.9
August	1265.0	968.2	1342.7	813.6	755.4	665.8	1252.1
September	1068.4	930.4	1329.2	659.9	648.7	530.4	1027.2
October	1424.1	1170.9	1236.3	872.4	860.2	707.3	1289.1
November	1181.3	933.4	1196.7	689.4	716.8	570.3	993.2
December	1058.6	832.3	1170.7*	686.3	644.6	563.1	970.8
1947 January	1163.8	951.2	1195.6	728.4	700.3	618.3	1058.0

(1) Held by producers and in British Iron & Steel Corp. stockyards at the beginning of the years and months shown.

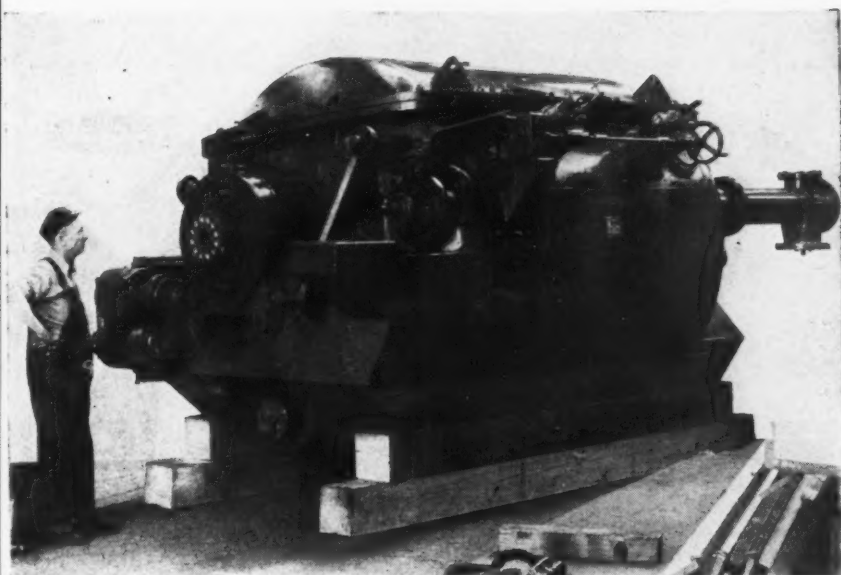
(2) All qualities, including ferroalloys.

* Revised.

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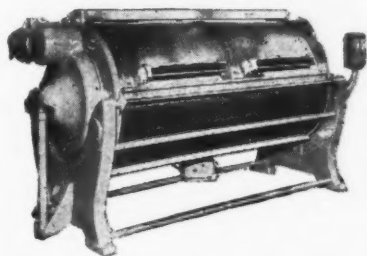


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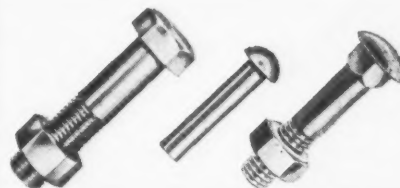
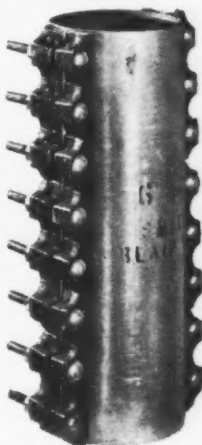


to corrosion from the alkaline soap and bleaching agents. At the same time they are easier to work, in this case, than stainless steel rivets which normally would have been specified for the job. Problems like these are a Harper specialty.

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PERSONALS

• **R. H. Daisley** has been appointed vice-president and director of manufacturing, and **H. J. McGinn** has been named vice-president and director of sales of **Eaton Mfg. Co.**, Cleveland. **Richard Inglis** was elected vice-president and general counsel for the company. Mr. Daisley has been manager of Wilcox-Rich Div. with offices in Detroit since 1936, and became a director of the company in 1941. He will make his headquarters at Cleveland. Mr. McGinn joined the firm in 1913 and has been general manager of the company's Reliance Div. Mr. Inglis has been associated with the Eaton Mfg. Co. since 1922.

• **Charles H. Cecil** has been appointed manager of sales of the Pittsburgh district, **Bethlehem Steel Co.** He succeeds **James F. Kratzer**, who has headed the Bethlehem sales organization at Pittsburgh since 1928, and who is now retiring. Mr. Cecil has been with Bethlehem Steel since 1926. He was made manager of sales at St. Louis in 1944. Mr. Kratzer was first employed by Bethlehem in 1912.

• **A. R. Robinson** has been appointed manager of **John A. Roebling's Sons Co.'s** Seattle branch. He joined the Roebling Co. in 1936 as a salesman in the Portland branch.

• **William C. Yarborough** has been placed in charge of aluminum sales for the **Reynolds Metals Co.** in the Little Rock, Ark. area. Prior to the war he served as secretary to former Gov. **Homer M. Adkins** and as secretary to former Sen. **Hattie W. Caraway**.

• **E. Halsey Brister** has been appointed sales manager of **Bay State Abrasive Products Co.**, Westboro, Mass., to succeed the late **Arthur G. Green**. Mr. Brister has been associated with the Bay State organization since 1944 acting in the capacity of quality control manager.

• **James F. Dailey** has been appointed assistant purchasing agent of **National Tube Co.**, Pittsburgh. He joined **National Tube** in 1942. He was office manager of the purchasing department and also handled special purchasing assignments during the war for the company's tubing specialties division.

• **David D. Cooper** has been appointed assistant to the president, **Portsmouth Steel Corp.**, Portsmouth, Ohio. Formerly connected with **Republic Steel Corp.'s** plant at Youngstown, for the past 4 years as chief industrial engineer, Mr. Cooper's new duties will be primarily of an advisory and analytical nature.

• **H. M. Hammond**, former general sales manager, and **P. S. Dickey**, former chief engineer, have been elected vice-presidents of **Bailey Meter Co.**, Cleveland.



JEROME A. RATERMAN, president, **Monarch Machine Tool Co.**

• **Wendell E. Whipp**, president of **Monarch Machine Tool Co.**, Sidney, Ohio, since 1931, has been elected chairman of the board, and **Jerome A. Raterman**, formerly executive vice-president, has been made president. As board chairman, Mr. Whipp succeeds **F. P. Thedieck** who died in January. Mr. Whipp joined **Monarch** in 1912 as general manager. Mr. Raterman came to the company in 1917.

• **R. R. Donaldson**, acting chief engineer of **Hagan Corp.**, Pittsburgh, since the retirement of **T. A. Peebles**, has been appointed chief engineer. Mr. Donaldson has been an important member of the Hagan engineering staff since 1918.

• **J. Hart Reece** has been appointed chief metallurgist of the **Minnequa plant** of the **Colorado Fuel & Iron Corp.** at Pueblo, Col. **John R. Zadra** has been appointed assistant chief metallurgist of the **Minnequa plant** and **William Carpenter**, process control metallurgist.

• **J. S. Hawley** has been appointed works manager of the **Oakland and South San Francisco plants** of the **California Wire Cloth Corp.**, west coast subsidiary of the **Colorado Fuel & Iron Corp.** Mr. Hawley started his industrial experience in 1928 as an industrial engineer for **Armour & Co.** He moved to the West Coast in 1930 where he was employed by **W. P. Fuller & Co.**, as industrial engineer and assistant to the plant manager. In 1934 he moved to the **California Cotton Mills** at **Oakland** where he served in several managerial capacities and left there to become superintendent of the **Oakland fabricating plant** of the **California Wire Cloth Corp.**

• **Walter P. Berg** has been elected vice-president and member of the board of directors of **Dravo Corp.**, Pittsburgh. He came to **Dravo** in 1923 as an assistant engineer and was active in engineering and sales work until 1938 when he became manager of the power department of the corporation's machinery division. In 1946 Mr. Berg was appointed general manager of the machinery division, in which capacity he continues in addition to his new duties.

• **R. S. Poister**, vice-president of the **Crucible Steel Co. of America**, New York, has been elected to a 3-year term as director. Re-elected to 3-year terms as directors were **William P. Snyder, Jr.**, chairman; **R. E. Christie**, executive vice-president; and **H. L. Gellinger**, vice-president.

• **C. D. Clawson**, vice-president in charge of sales and research of **Ferro Enamel Corp.**, Cleveland, has been named to the board of directors. Others named are: **F. S. Markert**, vice-president in charge of manufacturing; **W. B. Lawson**, president, treasurer, and a director of **Ferro Chemical Corp.**, a wholly-owned subsidiary; and **G. W. Wallace**, comptroller and assistant secretary, **Ferro Enamel Corp.**

PERSONALS

• Vere B. Browne has been named research consultant to Heppenstall Co., Pittsburgh, and Bridgeport, Conn. Lloyd R. Cooper, acting director of Heppenstall research, has been placed in complete charge of the management of the company's newly opened research laboratory and will direct the Heppenstall research program. Mr. Browne, who became an honorary vice-president when he retired in January as vice-president and technical director of Allegheny Ludlum Steel Corp., Pittsburgh, continues as research consultant of Allegheny Ludlum.

• Earle E. Ellwood has been appointed district sales manager in charge of the St. Louis district, Youngstown Sheet & Tube Co., succeeding H. H. Richardson, who has retired.

• Herman L. Moekle, vice-president in charge of finance of the Ford Motor Co., Dearborn, Mich., has resigned. He joined Ford in 1913 and worked in the accounting department at Pittsburgh and various branches until 1918 when he was transferred to Dearborn. He became auditor in 1927 and in 1941 was named assistant secretary. He was named director in 1945 and a vice-president in 1946.

• James Gerity, Jr. has been elected general manager and chief executive officer of Gerity-Michigan Die Casting Co. He is also chairman of the board. Charles Shanks, formerly vice-president in charge of the Adrian Div., has been elected executive vice-president and assistant general manager. William Steueve has been appointed general comptroller.

• Frederick W. McIntyre, Jr., with the company several years and a vice-president since April 1946; and Charles H. Carswell, general manager of Universal Winding Machine Co., Providence, have been made directors of Reed-Prentice Corp., Worcester, Mass. Mr. Carswell was treasurer of the Worcester company in 1932 when he went to Providence.

• Richard A. Puryear, Jr., formerly general manager of the Alabama Gas Co., Birmingham, has been elected a vice-president of the company.



C. C. CHAMBERLAIN, vice-president, Jenkins Bros.

• C. C. Chamberlain, general sales manager of Jenkins Bros., New York, has been elected a vice-president of the company. He joined the company in 1929 starting as an assistant in the advertising department, was appointed advertising manager in 1932, and advanced to publicity manager in 1940. He was named general sales manager in 1942. Mr. Chamberlain recently was elected to the board of directors of the company.

• Walter J. Kohler, Jr. has been elected president of the Vollrath Co., Sheboygan, Wis., and has resigned his position as secretary of the Kohler Co. Other officers elected were John M. Detling, chairman of the board and treasurer; Jean C. Vollrath, vice-president; Robert P. Vollrath, secretary, and Harold E. Schroeder, assistant secretary-treasurer.

• Elmer Schneider has been elected to a newly created position, vice-president and director of engineering of Wheelco Instruments Co., Chicago. Joseph A. Reinhardt will become plant manager and assume responsibility for all manufacturing operations. Mr. Reinhardt comes to Wheelco with a background of 25 years experience in production and engineering work with such firms as Westclox Div. of General Time Instruments Corp., Elgin National Watch Co. and the Dole Valve Co.

• D. K. MacLean has been appointed export manager for all lines of machinery manufactured by Farrel-Birmingham Co.'s four plants. He will make his headquarters at the main office at Ansonia, Conn., and will also continue his duties as manager of the sugar mill machinery sales department, a position he has held since 1929.

• William H. Milton, Jr., formerly assistant general manager of the General Electric Co.'s chemical department, has been elected a commercial vice-president. Mr. Milton will have responsibility for customer relations in the District of Columbia, with headquarters in Washington. Ray W. Turnbull has also been elected a commercial vice-president, and in order to be available for this position has resigned as president of Hotpoint, Inc. On Sept. 1, Mr. Turnbull, with headquarters in San Francisco, will assume responsibility for customer relations in an area which includes California, Arizona, Utah, Nevada, and Hawaii, and parts of Idaho and Wyoming. In the meantime, his headquarters will be in New York. Raymond M. Alvord, now commercial vice-president in San Francisco, will relinquish his post to Mr. Turnbull Sept. 1, and on Sept. 30 will retire after 43 years' service with the company.

• Harrison C. Bristoll, general manager of the steel strapping division of the Stanley Works, New Britain, Conn., has been elected vice-president of the company.

• Robert Beyer, formerly with Ernst & Ernst, has been elected a vice-president of Cleaver-Brooks Co., Milwaukee.

• Thomas B. Shull, formerly on the advisory staff of the Ordnance Technical Div., U. S. Forces European Theater, has joined the Jelrus Co., Inc. of New York as sales engineer in their industrial precision casting machinery division.

• Ralph E. Brierly, formerly New England representative for the Excello Corp., has become affiliated with the H. Leach Machinery Co., Providence. Mr. Brierly is in charge of sales for the Massachusetts and Connecticut district, which he has been covering for the past 5 years.

• **C. Grindrod** has joined the Dole Valve Co., Chicago, as plant manager. He was for the past several years connected with Bowser, Inc., at Fort Wayne, Ind., as assistant vice-president in charge of production, and with Joseph Weidenhoff, Inc., a wholly-owned subsidiary of Bowser, as plants manager.

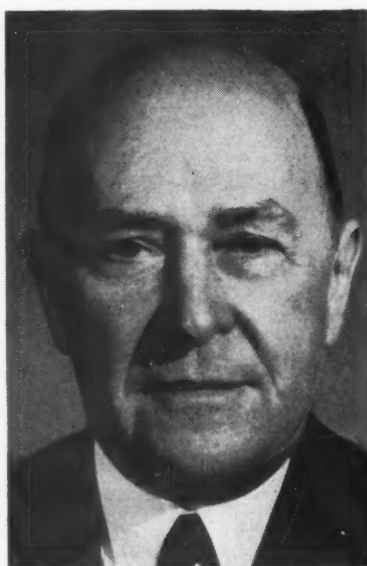
• **Joseph J. La Hodny** has been elected to the offices of president and director of the Standard Mirror Co., Buffalo, to fill the vacancies caused by the death of the late **William La Hodny**. Joseph J. La Hodny was active many years as sales manager of the Standard Mirror Co.

• **A. D. Robertson**, formerly assistant manager of sales and engineering of the electrical section at the Norwood, Ohio works of the Allis-Chalmers Mfg. Co., has been named manager of the company's Tampa, Fla. district office, succeeding the late **Berrien Moore**. Mr. Robertson joined Allis-Chalmers in 1938. He was named to his Norwood post in 1944. **Arthur D. Brown**, formerly manager of the Los Angeles Allis-Chalmers district office, has been named manager of the company's Washington office. **R. N. Landreth**, who has been acting manager of the Washington office, will now devote full time to his special duties as assistant to **W. C. Johnson**, vice-president of Allis-Chalmers' general machinery division.

• **Edgar F. Schaefer** has been elected president of the Gardner-Denver Co., Quincy, Ill., to succeed **H. G. Myers**, who became chairman of the executive committee. Mr. Schaefer was formerly executive vice-president of the company.

• **William A. Ross**, president since 1939 of the Columbia Steel Co., San Francisco, west coast subsidiary of U. S. Steel Corp., died of a heart attack Apr. 19.

• **Howard M. Fearon** of the engineering division, sales department of the Standard Oil Co. of New Jersey, New York, died suddenly on Mar. 27.



W. E. STEINWEDELL, whose election as chairman of the board, Gas Machinery Co., was announced in the Apr. 17 issue.

• **S. C. Starnaman** has been appointed chief inspector of the Oldsmobile Div. of General Motors Corp., Detroit. He has been with the division since 1930.

• **Stanley L. Bateman** has been appointed credit manager of Horace T. Potts Co., Philadelphia. Mr. Bateman has been with the company for 19 years and has served in various capacities with the company, chiefly in sales work.

• **Melvin E. Iten** has been appointed freight traffic manager and **Harold T. Hale** assumes the duties of passenger traffic manager of the Monsanto Chemical Co., St. Louis. Mr. Iten, employed by Monsanto since 1944, was formerly associated with the St. Louis-San Francisco R.R. Mr. Hale was city passenger agent at St. Louis for the C&O R.R. prior to his Monsanto appointment.

• **John K. McDonough** has been appointed assistant to the president and **James H. Dray**, director of purchases for Colonial Radio Corp., Buffalo, a wholly-owned subsidiary of Sylvania Electric Products, Inc. Mr. McDonough will assist in the direction and coordination of planning and scheduling for customers, the engineering division, and the production control and purchasing departments. He joined the Colonial staff in 1942. Mr. Dray joined the staff of Sylvania Electric at Ipswich, Mass. in 1942, where he served as purchasing agent for wartime proximity fuze production and as manager of purchasing and assistant to the general manager of Sylvania's fixture division.

• **Walter T. Johnson** has been appointed New York district sales manager for the Columbia Chemical Div. of Pittsburgh Plate Glass Co. He joined the firm's research department at the Barberton, Ohio plant during 1930 and has been associated with the chemical division since then. Following several years' service in plant production and technical service departments, he was manager of the Chicago district sales office for 3 years. His headquarters will be in New York.

• **F. W. Toone**, formerly with the War Assets Administration, has been employed in the Birmingham office of Philip W. Frieder Div., Luria Steel & Trading Corp.

• **Edwin E. Van Cleave** has been appointed sales engineer for the railway equipment division, American Welding & Mfg. Co., Warren, Ohio. Mr. Van Cleave will handle Armweld railroad equipment applications in the Chicago district.

...OBITUARY...

• **Rogers A. Fiske**, of the Bryant Machinery & Engineering Co., Chicago, died Apr. 16.

• **Dr. Herbert F. Whalen**, group leader of lacquer research at Monsanto Chemical Co.'s Merri-mac Div., Everett, Mass., died unexpectedly on Apr. 9.

• **E. L. Berry**, 52, vice-president in charge of production, Link-Belt Co., Chicago, died from a heart attack Apr. 3. Mr. Berry began his Link-Belt career in 1914 as a machinist at the company's Pershing Road plant in Chicago.

• **John T. Carroll**, 55, manager of the Buffalo branch of the Crucible Steel Co. of America, died Apr. 11. He had been with the company for 35 years.

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a lot
easier!"**

Yes, modern Fairbanks-Morse Scales win the approval of labor as well as of management . . . do their part to help keep workers contented.

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Motors • Pumps • Scales • Magnetos • Stokers
Railroad Motor Cars and Standpipes • Farm Equipment**

THE IRON AGE, April 24, 1947—89



Dear Editor:

INDUCTION HEATING

Sir:

In Newsfront of the Feb. 20 issue a paragraph described a new principle in induction heating whereby parts may be held at temperatures for pre-determined periods of time. This is the solution to a problem which is confronting us at the present time. As the article made no reference to a manufacturer, we are writing you to obtain this information.

F. GILLIG
Cornell Aeronautical Laboratory
Buffalo

● Newsfront introduced the Trigatron which is manufactured by Gordon Electronics, Inc., 224 Penn Ave., Pittsburgh 22. The unit is unusual in that it uses a gaseous tube instead of spark gap or vacuum tube for 60 cycle energy conversion into radio frequencies. Further, the use of this type tube permits constant output at the work coil, and the machine design embodies stepless power control.—Ed.

TRUCK ASSEMBLY CONTROL

Sir:

Can you tell me the name of the manufacturer of the TelAutograph referred to in your Feb. 6 Assembly Line, relating to Ford's new truck line at Highland Park?

FRED G. HOBBS
Production Engineer
Delco Products
Dayton

● TelAutograph is manufactured by the TelAutograph Corp., 16 W. 61st St., New York 23.—Ed.

BUSINESS PROCEDURE

Sir:

Several weeks ago you published an article prepared, I believe, by some business procedure men connected with RCA . . . This article described a system for handling technical information, bulletins, standards procedures, etc. . . . Could you locate a copy of the article for me?

R. C. BEAM
Manager
Welded Pipe Sales
Armco Drainage & Metal Products, Inc.
Middletown, Ohio

● "Standard Systems—Vital Aid to Management" by T. A. McMullen and J. H. Quick of RCA, which appeared in the Dec. 26 issue, is the article we believe you are seeking. Tear sheets are being sent.—Ed.

GRAINAL TREATMENT

Sir:

Reading the article entitled "Intensifying of NE 9440 Steel" in the July 1, 1943 issue, about the effect of the addition of Grainal on NE 9440 steel, it occurs to us that there being three kinds of grainal alloys on the market, it would be desirable to have a more precise knowledge before starting any

practical application of the process . . . We would be much obliged if you could tell us which alloy is referred to in the article.

PIERRE CHAUMELLE
Manager
Centre de Documentation
Siderurgique
Paris

● Vanadium Corp. of America informs us that in the process described in the article, Grainal No. 79 was used.—Ed.

LITHOGRAPHING EQUIPMENT

Sir:

Can you furnish us with a list of manufacturers of machinery for lithographing painted designs on sheet steel; also names of companies who do this on contract basis?

SAMUEL G. THOMSON, JR.
President
Thomson Equipment Corp.
Long Island City, N. Y.

● Lists of manufacturers of lithographing equipment and names of companies doing this type of work on a contract basis are being forwarded.—Ed.

METALLURGICAL MICROSCOPE

Sir:

Please send me tear sheets of "The Metallurgical Microscope—Its Range and Use" which appears in the Feb. 27 issue. Also, "Determination of Austenite Grain Size in Cast Steel" from the Mar. 13 issue.

K. G. PRESSER
Chief Metallurgist
National Supply Co.
Springfield, Ohio

THE SIX AGES

Sir:

1. Bone Age
2. Stone Age
3. Bronze Age
4. Iron Age
5. Short Age
6. Garb Age

We are now entering the
PAUL LEO
Precision Mechanical Laboratory
New York

SHAPE OF THINGS TO COME

Sir:

We would appreciate your furnishing us with 12 copies of the cartoon on p. 97 of the Mar. 20 issue, "The Shape of Things to Come."

GEO. T. WHITE
Geo. T. White Co.
Walkerville, Ontario

GRAY IRON STRENGTH

Sir:

We read with considerable interest the article on p. 53 of the Feb. 20 issue, entitled "British Report Method of Doubling Gray Iron Strength." This method, it is stated, has been developed by the British Cast Iron Research Assn. Would

you be able to help us procure further details regarding this process, or information concerning its progress or estimated date of release? Perhaps you could place us in contact with the British group.

JOHN H. SCHMID
Vice President, Engineering
J. A. Zurn Mfg. Co.
Erie, Pa.

● Additional information may be obtained by writing to British Cast Iron Research Assn., Alvechurch, Birmingham, England. All the information available at present was included in the article.—Ed.

LAPPING MACHINE

Sir:

We are interested in the roller lapping machine manufactured by the Spitfire Tools, Inc., as described in the Jan. 31, 1946 issue, p. 43. Can you supply us the address of this company?

P. M. STEELE
Steele's Cycle Shop
Lima, Ohio

● Spitfire Tools, Inc., is located at 2935 North Pulaski Rd., Chicago 41.—Ed.

ITALIAN PIG IRON

Sir:

We have read the very interesting and highly informative article, "Italy Plans to Double Pig Iron Production in 1947," written by your European editor, and which appeared in the Jan. 9 issue. We are desirous of obtaining permission to reprint the article and the tables of statistics contained therein, in our monthly publication *Trade With Italy*. It is understood that credit will be given to THE IRON AGE . . .

JOSEPH JORDAN
Editor
American Chamber of Commerce
for Trade with Italy, Inc.
New York

● Permission to reprint the article is granted.—Ed.

SENDZIMIR MILL

Sir:

We should be pleased to receive at your earliest convenience the address of the manufacturers of the Sendzimir precision cold strip mills described on p. 49 of the Jan. 16 issue.

VISSERIES & TREFILIERES
REUNIES
Haren, Belgium

● T. Sendzimir, the inventor of the mill, can be reached at the Armzen Corp., 703 Curtis St., Middletown, Ohio.—Ed.

COST SAVING PLAN

Sir:

Kindly mail us a copy of the article, "Bundy's Cost Saving Plan Adds to Employee Base Pay," which appeared in the Oct. 31 issue and was mentioned in the Feb. 13 issue, p. 134, in the news item, "Bundy Workers Profiting by Participating Cost Savings Plan."

ELMER F. SEMMLER
Works Manager
Francis Equipment Corp.
Coldwater, Mich.

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950

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HIGH-TENSILE

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GREAT LAKES STEEL
Corporation

**N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION**

THE IRON AGE, April 24, 1947—91

Industrial News Summary ...

- Scrap Prices Take Big Nosedive
- Deepest Cut Made at Pittsburgh
- Peace in Steel Seen for 2 Years

THE steel scrap market this week broke sharply in practically all consuming centers in the country. At Pittsburgh, the major steel center, heavy melting steel scrap prices took one of the biggest nosedives in history. Quotations there early this week dropped an average of \$5.25 a ton. At Philadelphia heavy melting grades were down \$3 a ton. Other declines were: Buffalo, \$4 a ton; Birmingham, \$3 a ton; New York and Boston, \$2.50; Cleveland and Youngstown, \$2, and Detroit, \$1 a ton. Average prices were off 50¢ a ton at Chicago but a greater reaction is expected there next week.

THE IRON AGE scrap composite price, which includes the averages of Pittsburgh, Philadelphia and Chicago heavy melting quotations, declined this week to \$31.83 a gross ton, a drop of \$2.92 from last week's figure of \$34.75. The price this week is down \$7.84 a ton from the all-time-high reached in the middle of March when the composite was \$39.67. The completion of old high priced orders and a general reaction from the ridiculously high quotations of a month ago were the major reasons for the decline. Some sources saw this scrap price drop as an indication of a more normal steel market in the months to come.

SIGNIFICANT trends in the U. S. Steel-United Steelworkers wage contract, which will be accepted by other steel companies, included: Emphasis by Mr. Murray on the 2-year time limit; accent on the various social features of the agreement; the fact that the contract was retroactive to Apr. 1 instead of Feb. 15, the date when the original contract expired; and finally the brushing off by the union of the whole portal-to-portal question except where an individual wants to keep it alive.

Both the union and the company have estimated the cost of the new wage agreement, but its actual effect on steel earnings will not be known for a few months at least. It appears that the cost will be so great that any chance of base price cuts in the steel industry can be termed no more than a mere possibility. But there is every indication that U. S. Steel Corp. is banking heavily on greater employee morale and efficiency to prevent the necessity for any upward change in current steel prices.

Steel processors who in years gone by have more or less had to accept the big steel wage contract pattern are going to find the new contract tough going. Already there are deep rumblings as to their inability to pay such a wage bill. However, it is expected that the broad outlines of the U. S. Steel contract will be adhered to and that local issues will be worked out with the union.

EXCEPT for the possibility of labor trouble in the coal mines on July 1, the steel industry is now able to concentrate its full attention on steel produc-

tion. This week the steel ingot rate is up one-half a point to 95 pct of rated capacity. This rate may be bettered by at least a point next week. Scrap supplies are easier, pig iron production is increasing and employee productivity is expected to increase as a result of wage agreements.

Steel firms have already made considerable headway in reducing unwieldy backlogs. Most steel producers broke all previous peacetime production records in the first quarter of this year and the same trend continued into April. Allotments to steel consumers now being mailed indicate a slightly easier steel situation over the next several months. Some sales people believe that deliveries on bars, plates, structurals and even some wire products will be definitely easier going into the third quarter. The sheet supply, however, showed no signs of improvement this week.

Large users of hot-rolled sheets may be forced to shift to cold-rolled sheets if they are to maintain high production. The increased emphasis on cold-rolled sheet output has cut down the available supply of hot-rolled sheets. One large fabricator of automobile frames was considering this week a switch to cold-rolled material by the fourth quarter if the supply picture on hot-rolled sheets does not change.

A leading steel producer has taken a poll of general contractors and has found that 53 pct feel that construction prices have reached the high point and from here on will decline. Straws in the wind indicate a slowing up in consumer demand for some manufactured products. On top of these signs are the moves of many steel companies to solicit new business on some carbon steel rounds and for alloy steel products.

SALES officials this week were pointing out that some confusion may have arisen over talk about a recession in the steel industry. Most sales research men do not look for a severe setback this year but would not be surprised to see steel shipments and operations at lower levels by the end of this year. There is no thinking this week of a deep cut in the steel ingot rate although it is believed that it may not remain at peak levels during the last quarter of 1947.

Major worry of some steel sales officials is the possibility of competitive price cutting on some products by the end of this year or early in 1948. The exceptionally high cost of the new wage agreement, however, may prevent any widescale and unusually deep price declines such as occurred in 1938. But many officials have their fingers crossed.

Steel order volume this week showed little change from a week ago, but the volume of orders placed so far this month has been behind the comparable period a month ago. Most steel firms continue to keep production as high as possible on those items which have the greatest return pricewise.

• **GOOD BYE**—Virtually all members of Industry Advisory Committees which have assisted CPA for the past year and a half have been released from further government service. Committees which will remain subject to call by CPA or which may themselves request meetings with Government officials are: Tin and Tin Products, Antimony, Rubber, Cinchona Bark and Alkaloids, Streptomycin, and Cordage and Cordage Fibers. In addition, some 75 committees in the building materials field will remain operative and on call by the housing expediter.

• **WIRE EXTRAS SLASHED** — Revisions in extra charges on hot rolled wire rods, welded wire fabrics, and certain types of manufacturers' wires, which in the aggregate result in price reductions, were made by the American Steel & Wire Co., U. S. Steel subsidiary.

• **EXPORT TRENDS**—Although overall domestic exports registered a gain in February of 3.5 pct over January says the Bureau of the Census, total U. S. domestic exports were \$1,134,000,000 for February; finished products were \$675 million, double the amount in February 1946 and semi-manufactures \$115 million. Total exports of iron and steel semi-manufactures dropped from \$30 million to \$28 million but plate and sheet shipments increased from \$9.9 million to \$11.4 million, the only type to register a gain. All types of machinery decreased in shipment value and steel mill manufactures dropped by \$3 million to \$24.2 million. Exports of new automobiles decreased from 19,422 in January to 18,840 in February but the foreign shipment of trucks and busses rose from 19,738 to 21,630.

• **TC&I TO BUILD**—Application of the Tennessee Coal & Iron Co. of Birmingham to build additional facilities estimated to cost in the neighborhood of \$1,687,000 has been approved by the Office of the Housing Expediter. The projected plant expansion is needed by TC&I in order to increase its production facilities for black and galvanized sheets which are deemed critical materials and in short supply.

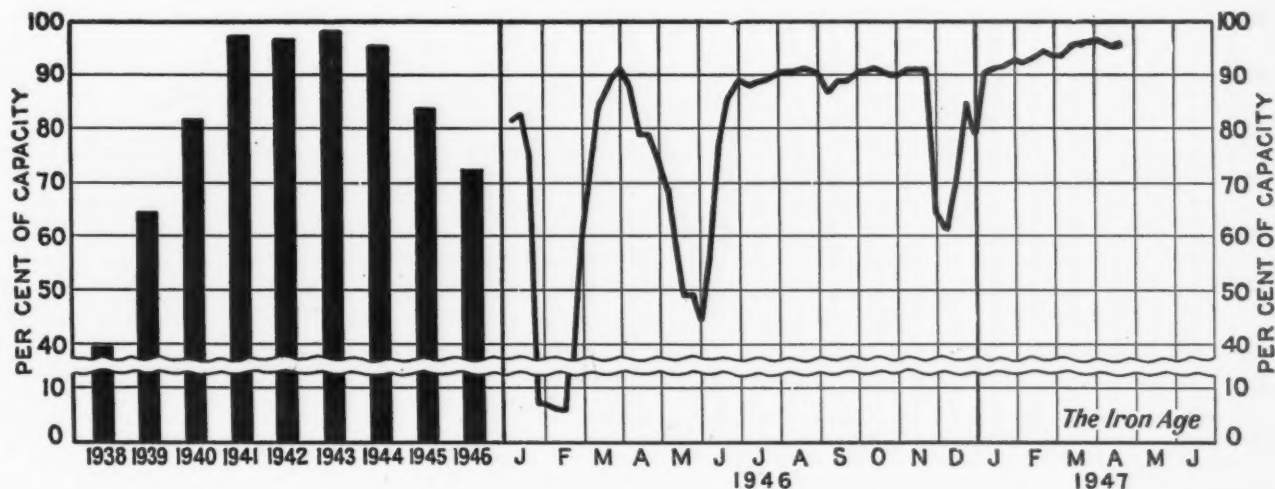
• **ANOTHER STEEL STUDY?**—Should a resolution calling for an investigation of the copper industry, based on FTC's recent copper report, be approved by Congress, the steel industry may find itself the object of a similar resolution. The resolution relating to copper is bottled up in the House Rules Committee, where certain members are trying to sidetrack it. Coincidentally, Congressional moves in this direction parallel the FTC study of basic industries.

• **CONSTRUCTION APPROVALS** — Nonhousing construction approved during the 12-week period from Jan. 10 to Apr. 3 totaled \$566 million for a weekly average of \$47 million as against a weekly permissible average of \$50 million, the Office of the Housing Expediter reports. During the last week of that period, 2233 applications were approved for a total of \$57,877,000, while 1053 applications were denied for a total of \$22,823,000. From Mar. 26, when the construction authorization order (VHP-1) went into effect, to Apr. 3, 93,373 applications were approved for a total of \$3,076,365,000 while 60,646 applications were denied for a total of \$2,194,530,000.

• **BRITISH STEEL OUTPUT**—Steel production in March 1947 totaled 950,000 tons compared with 1,107,000 tons for the same month last year, and pig iron 597,000 tons against 714,000 tons last year. Production for the first quarter of this year of 3,144,000 tons of ingots is probably the key to output for the entire year. The first and last periods are usually highest in the British industry.

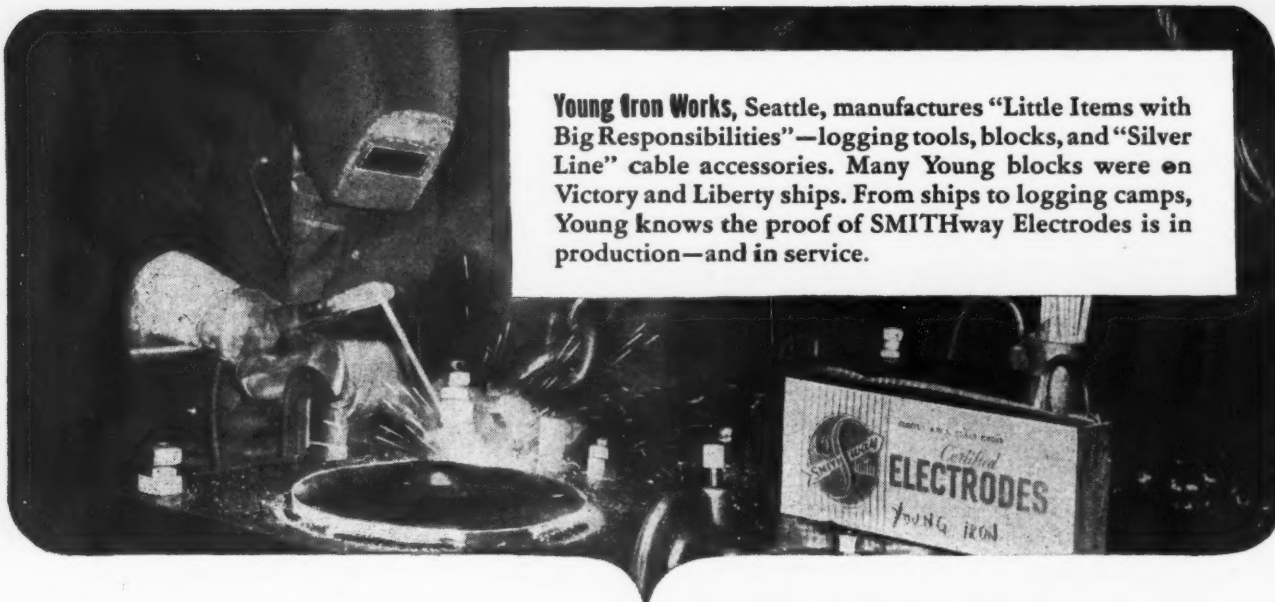
• **STAINLESS PLATES**—With the installation of new pickling tanks and other auxiliary equipment, the Carnegie-Illinois Steel Corp. can now produce at its 160-in. mill at Homestead stainless plates up to 132 in. in width and 450 in. long. The lightest thickness is 3/16th in. and at this gage the width is limited to 100 in. and the length 360 in. The company is further exploring the possibility of exceeding the published limitations and expects to soon be able to increase the number of sizes available. The plates are being used in tank cars and heavy equipment and can be rolled from most popular types of stainless.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 15.....	101.0	96.5	90.5*	90.0	97.0*	102.0	100.0	99.0	102.5	100.0	95.0	80.0*	95.0	94.5
April 22.....	101.5	96.0	91.0	90.0	97.0	102.0	100.0	99.0	102.5	98.0	95.0	88.5	95.0	95.0

* Revised.



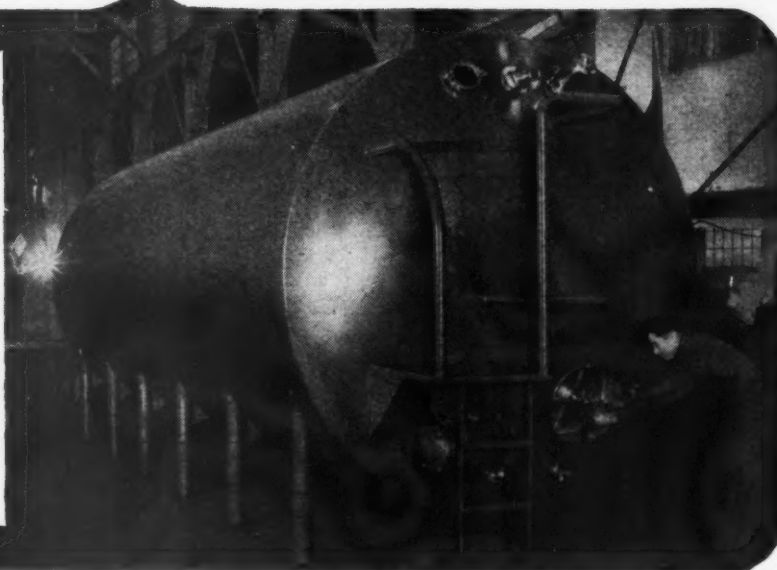
Young Iron Works, Seattle, manufactures "Little Items with Big Responsibilities"—logging tools, blocks, and "Silver Line" cable accessories. Many Young blocks were on Victory and Liberty ships. From ships to logging camps, Young knows the proof of SMITHway Electrodes is in production—and in service.

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SEATTLE 1 • SAN FRANCISCO 4 • LOS ANGELES 14
INTERNATIONAL DIVISION: P.O. BOX 2023, MILWAUKEE 1

Overall Steel Demand Called Good Despite Weakness in Spots

Pittsburgh

••• Steel supply is catching up with demand in spots and in some cases price is looming larger in the mind of the customer. Some people see these factors as signposts on the route to a recession but the industry's overall production and sales picture looks good for some time to come.

In the carbon steel lines, wire rope is about the only product that can be ordered for prompt delivery. While demand is tapering off on cold-finished and mechanical tubing, it is still sufficient to insure fairly steady mill operations.

Currently, the product mix in the steel industry has not reached what might be termed a prewar normal. Ingots have a curious way of finding themselves finished into more profitable products or into products where public and governmental pressure forces production. Typical of the former are cold-rolled sheets and typical of the latter are nails. While percentage-wise nail production is not up, tonnage-wise it has increased substantially.

Hot and cold-rolled sheets and strip, wire products, tubular goods, bars, structurals and railroad materials are in strong demand, with deliveries running from 3 months to the end of the third quarter. Most mills have not booked beyond that period, but there is sufficient demand to carry the backlog well into next year on most items if the mills opened their books.

Cold-finished bar and mechanical tubing markets are not as strong as they were up to the beginning of the year. While small sizes of cold-finished bars are still in pretty strong demand, there has been a tapering off of the total demand. The mechanical tubing market, observers state, is reflecting the high selling prices of products and gadgets made from this material. A lot of this tubing goes into such consumer products as tubular furniture, bicycles, velocipedes, displays and hand tools, and into domestic and commercial equipment, to say

Tool Steel, Stainless Reported Easier; Other Deliveries 3 Months or More

• • •

By THOMAS E. LLOYD
Pittsburgh Regional Editor

• • •

nothing of the automotive and railroad industries.

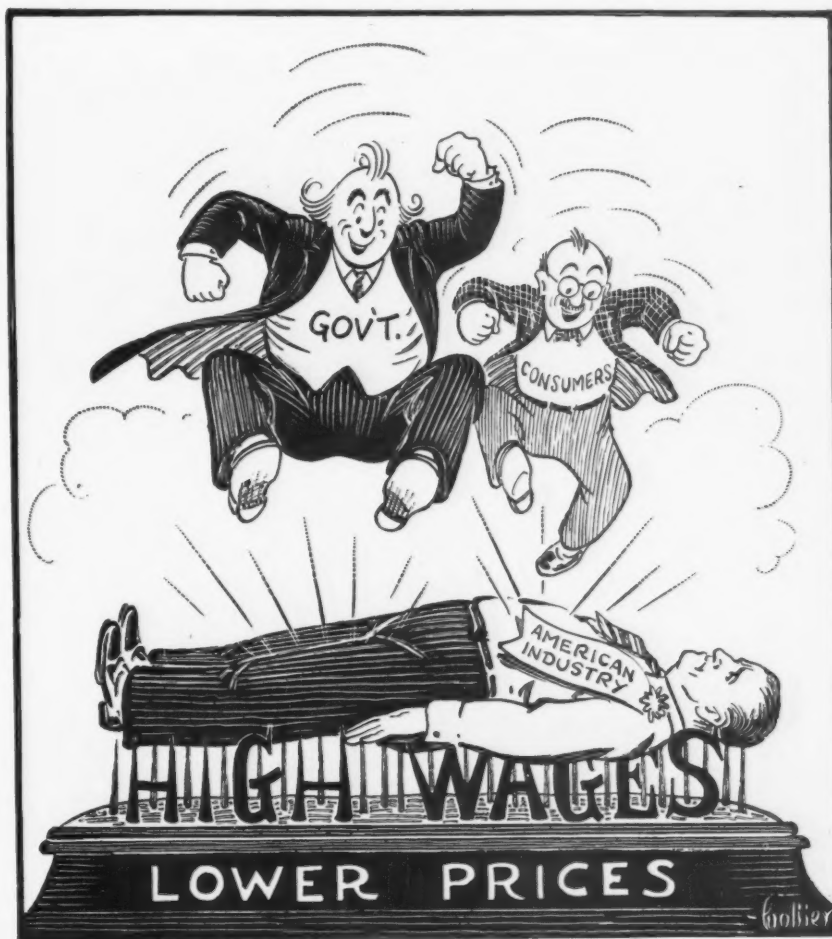
On the consumer products, it is felt by some that prices are so high that the items are being priced out of the market. On the industrial items, such as cars and railroad rolling stock, production has not hit a pace that takes up

the entire capacity of the industry.

There seems to be no letup in the demand for wire products. The rod supply situation is very critical; redrawers are having difficulty obtaining rods from the mills. Mill finishing capacity is operating at close to 100 pct, using nearly all of the available wire rods. Deliveries on rods are now running 3 to 6 months. Wire customers are pressing the mills to open their books for fourth quarter orders, and this may occur within the next week or so.

Light gages of drawn wire are in acute demand; deliveries are running from 3 to 6 months, mainly because the producers are using this wire for finished prod-

Right in the Middle



ucts such as nails, fencing and barbed wire. Wire heavier than 9 gage can be procured in about 3 or 4 months.

Nail demand is easing up in specific geographical areas, but the allover demand is still strong. Despite sales of War Assets Administration surplus nails, manufacturers report that the total has not been large and the condition of nails sold has often been bad. Some rather large quantities, estimated at about 25,000 tons, exist at Okinawa and another Pacific island, but observers indicate that no one will bid on them.

Barbed wire demand is heavy but spotty; domestic inquiries are strong and production is behind demand. However, there are many fantastic—but worthless—foreign inquiries. Often they are not valid; the person or company making the inquiry is not financially capable of handling the material, or some condition exists that disposes of the inquiry. Woven wire fencing is in fair demand; deliveries are running about 3 months.

Electrical sheet demand, like cold-rolled sheet demand, is strong and there is no sharp break indicated for at least 2 years. Despite better deliveries of specific types of electrical equipment

such as motors and transformers, manufacturers of these items are still trying desperately to maintain a steady flow of high silicon sheet to their plants. The rural electrification program, just getting underway, will only tend to strengthen the demand for this product and sustain that demand for at least a couple of years.

Tool and die steel producers are now operating at about 60 pct of capacity, and await impatiently for Detroit to start tooling up for new car models. Government surpluses in this field have had a very definite depressing effect on business, but it is hoped that new tooling by the automotive industry will sharply boost tool and die steel demand. Business is somewhat better than in 1946, but still it is not at the stage where deliveries are extended.

The stainless business, like the alloy business, is quite current. The Pittsburgh gas strike hit stainless output and somewhat extended backlogs, but they are relatively smaller than they are in carbon steels. Stainless sheet demand is strong, and will continue so for the balance of the year, as will the demand for stainless wire and tubular products. There is an over-capacity for

strip now, and supply is well caught up with demand. Bar demand is nowhere near capacity, deliveries are prompt, and bar making facilities are operating at about 75 pct of capacity.

Stainless plates are currently in good supply, but observers believe that demand will increase sharply when the expansion of the chemical and processing industries really gets underway. New equipment and maintenance for these industries should strengthen the plate market for the coming year and a half to 2 years. Carnegie-Illinois, utilizing its new 160-in. plate mill at Homestead, has stainless plate capacity to spare and is actively soliciting business.

By the end of the second quarter, it is anticipated that the average delivery time on stainless products will be from 6 to 8 weeks. Producers with both carbon and stainless steel making and finishing capacity are reported to be insisting that their carbon steel customers sweeten up their orders with some stainless business.

The recent threat of a steel strike caused consumers of steel to put pressure on the mills to speed up deliveries of steel products. While this does no particular good, it is evidence of the continued serious need for steel products. Further, while consumers' stocks of steel are believed to be relatively high in specific categories, the all-over inventory picture is not one to long sustain fabricator or processing operations.

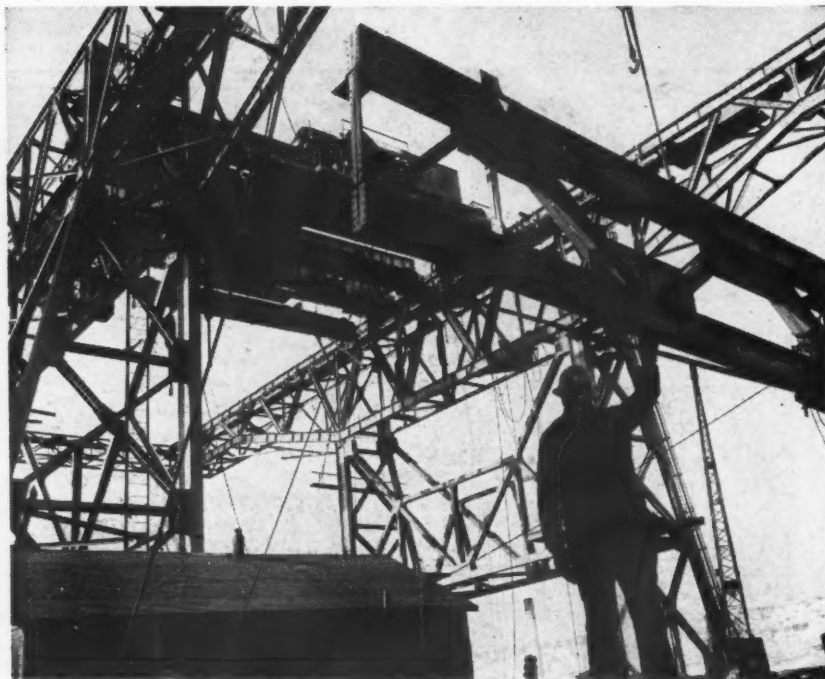
Urges Shippers Cooperate

Detroit

••• Because of the serious freight car supply situation, the Great Lakes Regional Advisory Board has suggested that receivers advise their shippers the type of cars used on outbound loadings, and that attempts be made by shippers to use this type of car whenever possible.

Specifically, plant "B" advise plant "A" on the type of cars used for outbound shipments. A request would be made of plant "A" to use this type of cars whenever possible. Plant "A" would then attempt to use on future shipments to plant "B" the type of cars requested by plant "B."

SEATRRAIN CRANE: A 15-ton truss swings into place at the Seatrain terminal, Edgewater, N. J., eastern terminal of Seatrain Lines. The crane was recently completed and picks up freight cars, placing as many as 100 aboard the Seatrain ships for voyages to Gulf Coast ports. American Bridge Co., U. S. Steel subsidiary, fabricated the structure at its Ambridge, Pa., and Trenton plants.



Better Deliveries on Aluminum Products Spur New Uses

New York

••• Recently improved delivery time for aluminum products and a price structure that has not been significantly increased since the end of the war have placed the aluminum industry in a firm competitive position with respect to other metals.

Aluminum producers, handicapped by a shortage of ingot capacity since the end of the war, have been diverting much of their output to their own fabricating plants. Foundries feel that they have been cut off from sources of virgin ingot but one producer says that ingot has been sold sparingly to the foundry industry within the limits of available supplies.

In the shortage of ingot, major producers have been importing ingots from Canada. Reynolds Metals Co. reports its ingot production increased to 380 million lb in 1946 from 165 million lb in 1945. Alcoa has not added to its ingot production facilities but reports a 3 pct increase in pig production in 1946 compared with 1945.

Orders are currently being taken in this area for June delivery of sheets, extrusions and tubing—a significant change from the order outlook only 2 months ago. There are appreciable stocks of wire, rod and bar available for immediate delivery.

There has already been a marked trend toward the replacement of consumer demand for some metal products by aluminum. The improved order position is expected to result in additional business of this nature.

One of the most significant trends in the entry of aluminum into new fields is the situation in the electrical conductor industry. Aluminum has been used for many years in the form of steel-reinforced aluminum cable where savings have been effected by lengthening the cable span between suspension towers. Recently a number of wire and cable manufacturers have turned to the use of aluminum as the conductor in insulated building wire in sizes as small as 12 AWG.

The U. S. Rubber Co. began the production of aluminum building wire about a year ago. Since the

Aluminum Producers Funnel Much of Their Output To Subsidiary Plants

• • •

By JOHN ANTHONY
Eastern Regional Editor

• • •

Underwriters' Laboratories approved the use of U. L. labeled aluminum building wire on Sept. 1, 1946, a number of additional wire producers have entered the field.

Among these are General Cable Corp., New York, producers of aluminum service wire and city distribution cable; Okonite Co., Passaic, N. J., producers of premium aluminum building wire; Hazard Insulated Wire Works Div., Wilkes-Barre, Pa., and Crescent Insulated Wire & Cable Co., Trenton, N. J. General Electric Co. has obtained Underwriters' Laboratories approval on its polyvinyl-resin-insulated aluminum cable identified as Flamenol.

A number of manufacturers have developed and marketed aluminum solder and flux suitable

for the same soldering techniques used on copper. Among these are Aluminum Co. of America, Pittsburgh; Lloyd S. Johnson Co., Chicago; Eutectic Welding Alloys Co., New York, and Aluminum Solder Corp., New York.

Wiring connectors, used in an estimated 75 pct of building wire applications, specially designed for mechanical connections in aluminum wire, have been placed on the market by Burndy Engineering Co., Buchanan Electric Products Co., Thomas & Betts Co., and Aircraft-Marine Products, Inc.

It is estimated that all forms of wire represents 25 pct of domestic consumption of copper. Wire consumption will not, of course, represent a similar tonnage of aluminum even when the market potentialities are fully realized. Applications for small wire gages, such as motor windings, will continue to employ copper.

Wire producers indicate that there is no material change required in wire drawing aluminum. The same equipment is used and it operates at the same speeds. However, copper requires a soapy lubricant, whereas aluminum requires oil.

ANOTHER PORTAL CASE: *These cheerful looking miners have just come through the revolving door at the entrance to the Willow Grove mine of the Hanna Coal Co., St. Clarksville, Ohio. This portal is 4 miles nearer the diggings than the old portal. Besides, it has showers, a modern dressing room, a lounge and a restaurant.*



Once Again Fairless and Murray Pitch the Ball to Each

New York

• • • Behind the official sugar of company and union statements on the steel wage agreement is a human story. For the umpty-umph time Ben Fairless and Phil Murray have gotten together just at the right time to untangle what could have been a bad situation.

Both have a simple approach to problems and both hate detail. But they have good detail men working with them and when the basic framework is built by these two men—things happen. Ever since they sat down together for the first time 10 years ago last month, they have been taking each other's measure. What they have seen, they have liked.

Philip Murray wrings the last bottom dollar out of his meetings with Benjamin Fairless, and Ben sees to it that it is the bottom dollar and no more. Both are consistent; they hate warfare and strikes even though outside pressure for a "fight to the finish" has been put on them many times.

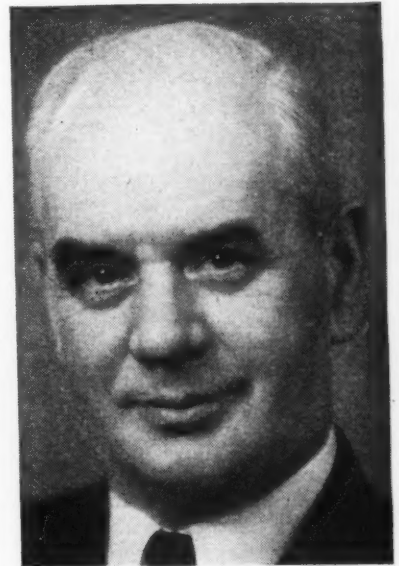
Ten years ago Mr. Fairless said, "The history of industrial strife in the past has shown that there were few instances in which that which was gained by shutting down plants, disturbances and bloodshed could not have been gained through peaceful methods, through discussion and mutual problems across the conference

table"—he thinks and acts the same way today.

Ten years ago Philip Murray was well on his way towards organizing the industry's steelworkers—a job the old Amalgamated Iron, Steel and Tin Workers either could not do or did not want to do. Some of the wise boys in the industry said it wouldn't last long—but it did, and the same two men started a ball rolling early last week which ended with the announcement of one of the most enlightened contracts the Steel Corp. ever became a party to.

In 10 short years Big Steel under Mr. Fairless has rapidly embarked on a social-minded labor policy which got its initial push from Myron C. Taylor—the U. S. Steel director and former chairman whose name is still roundly cursed in some circles. But things have moved quickly down the line also. When it looked as if Phil Murray was tired of waiting around for a wage offer and when it looked as if the legal minds of the Steel Corp. were in full sway, Mr. Fairless, responsible for production, sales and industrial relations of Big Steel, stepped in and paved the way for his helpers.

Seeing that Mr. Murray was a "trifle" upset over the waste of good time since Jan. 15 and realizing that the company's booming



MR. MURRAY SAYS: "This contract will be hailed throughout the United States not only by the members of the union but by the people generally. It reflects a direct contribution to the welfare of the nation and its people. It removes certain elements of doubt concerning the things that labor and industry can do to preserve decent, peaceful and honorable relations. The contract definitely assures peace in the industry for two years. It develops a pattern that other industries can take up and adopt because it reflects good, decent, sound relationships between management and labor."

• **CONTRACT DATES**—The U. S. Steel Corp.—USWA contract is retroactive to Apr. 1, 1946. It runs for 2 years expiring May 1, 1949. Either side can reopen the contract next year on the wage problem alone.

• **INCREASE**—The general wage increase amounts to 12½¢ an hr or \$1 a day. According to the union, another 2½¢ has been granted to cover wage inequity and differential adjustments. The company made no estimate on this phase but confirmed that adjustments would be made.

• **BASE RATES**—The basic labor rate of 96½¢ an hr becomes \$1.09 an hr under the new contract. The top rate in the wage scale becomes \$2.25 an hr. Job classifications approved between the union and the company on Jan. 24, 1947 numbered 31, ranging from 96½¢ an hr to a top of \$1.98 an hr. The increment between the classifications was 3½¢ an hr. Under the new contract this difference is now 4¢, starting with \$1.09 and ending with a top of \$2.25. This adjustment took care of workers who had benefited by the job classification agreement and included them in the new general wage increase.

Details on U. S. Steel-USWA

• **WAGE COST**—U. S. Steel Corp. says the entire wage program will cost them \$75 million a year. The union says \$42 million. The difference is caused by both sides talking about different costs. Mr. Fairless' estimate covers the cost when applied to all subsidiaries of U. S. Steel Corp. The actual wage bill will not be known for several months additional cost to the industry will come from white collar increases.

• **SEVERANCE PAY**—A steel worker displaced through a permanent shutdown of a plant or department he gets severance pay. It will range from 4 weeks' pay for 3 years' service up to 8 weeks' for 10 years.

• **VACATIONS**—For the first time in steel industry history 3 weeks' vacation with pay is granted to employees with 25 years' service. One week's vacation is granted for one year's service and two weeks for 5 years' service.

Other and Prevent a Bad Situation . . .

By TOM CAMPBELL
News-Markets Editor



MR. FAIRLESS SAYS: "The completion of a new wage agreement between the five basic steel producing subsidiaries of U. S. Steel Corp. and the United Steel Workers of America (CIO) is gratifying to us. We feel certain that this is good news to our big family of loyal employees. That the negotiations were carried to a successful conclusion without cessation of production is particularly pleasing. I am sure we can count on all employees to do their part in helping to meet the additional employment costs by continuing to achieve and maintain the most efficient production of which they are capable."

first quarter earnings statement would be soon read with avid interest all over the country, Mr. Fairless convinced his associates that now was the time to get going.

After the outlines were drawn up the detail men were brought in and started to sweat it out. Head man for the corporation on this tremendous task which was completed in an unbelievably short time was Jack Stephens, liberal-minded U. S. Steel vice-president in charge of industrial relations. As usual in these gold plated conferences Phil Murray was the man across the table. These meetings were carried on in secrecy last week except for a slight disturbance on Thursday night, when THE IRON AGE reported that conferences were going on, an offer had been made and that there would probably be no steel strike.

While Mr. Stephens and Mr. Murray filled in the details, argued back and forth and generally made life miserable for each other until the early hours of each morning, both sides were assisted at various times by their legal advisers: Roger Blough for the steel firm and Lee Pressman for the union. Since there was much work to be done and checked back and forth, Mr. Stephens was assisted by R. C. Cooper, his assistant, and Leroy Lewis, company attorney.

Not to be outdone with such evidence of corporate front, Mr. Murray had his right-hand man, Dave McDonald, and Jim Thimmes to help keep up his end of the argument. All these men quietly operated while practically all newspaper reports denied the existence of such a thing as negotiations.

By Sunday afternoon the detail men on both sides were ready to let go of their handy work and give it to the public relations departments, both of which are a long cry from the identical setups 10 years ago. As usual Vin Sweeney, USWA public relations director and former *Pittsburgh Press* labor reporter who used to send his dispatches from the actual labor meetings, beat the corporation's mighty setup by a few hours even though he did leave out the details on the portal-to-portal issue which the corporation felt was quite important.

With a clattering of teletypes and the portal-to-portal problem settled to the satisfaction of the Steel Corp.'s lawyers, the second official release on the contract which meant no strike and a peaceful year or two in the steel industry was let loose by J. Carlisle MacDonald, the Steel Corp.'s assistant to the board chairman and his assistants at New York, Pittsburgh, Chicago, and a few other points.

2-Year Wage Contract

• **PORTAL-TO-PORTAL**—The union agrees the company shall not pay for travel or walking time or time spent in preparatory and closing activities during the length of the contract. The union will neither make new claims or aid existing or future claims against the company for portal-to-portal time, prior to the termination of the new agreement.

• **AVERAGE EARNINGS** — U. S. Steel Corp. average earnings under the new agreement will be about \$1.47 an hr—about 73 pct greater than the comparable rate of 85¢ an hr in January 1941. The company says average weekly earnings of steel workers last month were \$52.50—under the new agreement this would have been \$58.50, the company reports.

• **PRICES**—U. S. Steel Corp. hopes that increased costs can be absorbed under present steel prices. This means there will be neither price reductions nor price increases for the time being at least. The company is counting heavily on employee cooperation to keep costs down.

• **GEOGRAPHICAL DIFFERENTIALS**—The present southern differential of 17½¢ has been reduced by 3¢. The 2½¢ differential at the corporation's Duluth plant of American Steel & Wire has been eliminated. This means that the southern workers of the corporation received a minimum general increase of 15½¢ an hr exclusive of other benefits while the Duluth workers received a general minimum increase of 15¢ an hr.

• **WELFARE PACKAGE**—U. S. Steel Corp. has agreed to participate in the establishment of a new plan involving life, accident, health, medical and hospital insurance. The coverage and content of the new plan, its effect on the present U. S. Steel group life insurance plan, and other pertinent considerations, will be studied by the union and the company. The study must be finished by Nov. 1 of this year. An agreement will follow the study.

• **MAINTENANCE OF MEMBERSHIP** — Despite shadow-boxing on both sides the same form of maintenance of membership as has been in previous contracts is retained. Employees may withdraw from the union within 15 days after the contract has been signed. If they don't their dues are deducted by the company after that time.

Veto Seen If Senate Follows Lead of House On Labor Legislation

Washington

••• The House of Representatives last week passed the most drastic labor legislation in the history of the American labor movement. Stripped of practically all its wartime powers relating to labor disputes, except the seizure authority, the Administration will probably urge a veto if any measure similar to the House approved bill is presented to the President.

The House labor bill was passed by a large majority last Thursday in virtually the same form reported in THE IRON AGE (Apr. 17, p. 106).

Instead of the predicted fight to tone down some of the provisions, the greatest difficulty met by the GOP sponsors was to prevent even more drastic amendments from being added on the floor.

Size of the vote, 307 to 108 (with 93 Democrats voting with the majority) was seen here as indication that the House would not accept the greatly modified version reported out of the Senate committee as well that the House could muster sufficient support to override a presidential veto.

Senate debate was scheduled

for this week when a fight will be made on the floor to insert sharper teeth in the Senate bill. Senator Taft said he would support a move to ban industry-wide bargaining when the bill is brought up. This is not included in the present Senate version.

In addition to outlawing industry-wide bargaining, the House bill outlaws the closed shop but permits the union shop by which

a worker must join the union within 30 days; prohibits strikes to obtain the union shop or maintenance of membership; makes unions subject to anti-trust laws; prohibits jurisdictional, sympathetic or sit-down strikes, secondary boycotts, mass picketing and strike violence, and permits the government to stop nationwide strikes where public welfare is involved.

Westinghouse Grants 15¢ an Hr Increase To Electrical Union

Pittsburgh

••• An agreement has been reached between Westinghouse Electric Corp. and the CIO-United Electrical Workers providing for a 15¢ an hr increase in "settlement of all of the economic issues." This agreement affects about 75,000 of the 97,000 production and salaried employees of the company.

Effective Apr. 1, 1947, under the terms of the contract, all wage rates of the hourly paid employees represented by the union will be increased by 11.5¢ per hr, and the remainder of the 15¢ will be used to cover the cost of 6 paid holidays, 3 weeks vacation for employees

with 20 years' service, and other economic issues.

Salaried employees represented by the CIO-UE will receive \$5.00 per week increase, 3 weeks vacation for employees with 20 years service, improvements in the overtime provisions, and several other improvements in working conditions.

The contract, which settles all economic issues until Apr. 1, 1948, is subject to ratification by the union conference board of Westinghouse locals and by the membership, on or before Apr. 28. In addition to the economic issues, a number of contractual changes were made.

Westinghouse and the union have discussed health, welfare, and insurance programs and will continue to discuss them, from time to time, throughout the contract year.

This is the second major settlement in the electrical manufacturing industry made by the CIO-UE in a week. Negotiations have been going on since January at Westinghouse, and the agreement was announced in a joint statement by W. G. Marshall, vice-president of Westinghouse Electric Corp., in charge of industrial relations, and James J. Matles, director of organization for the CIO-United Electrical, Radio and Machine Workers of America.

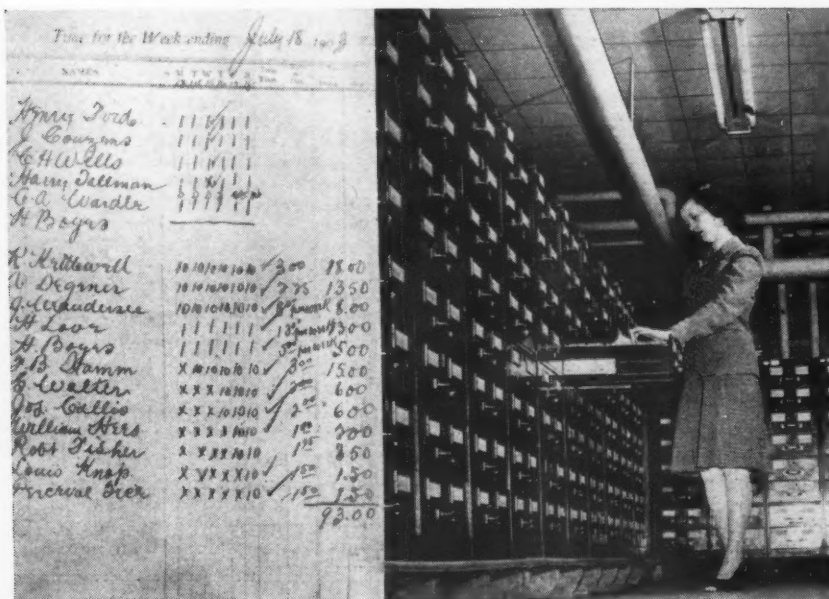
Employment Shows Gain

Washington

••• Despite sharp postwar cutbacks, the aircraft and shipbuilding industries were employing four times as many workers in late 1946 as in 1939, Bureau of Labor figures show.

Metalworking industries also showed substantial gains as did nearly all others. The increase in employment over 1939 for the country as a whole is about 56 pct.

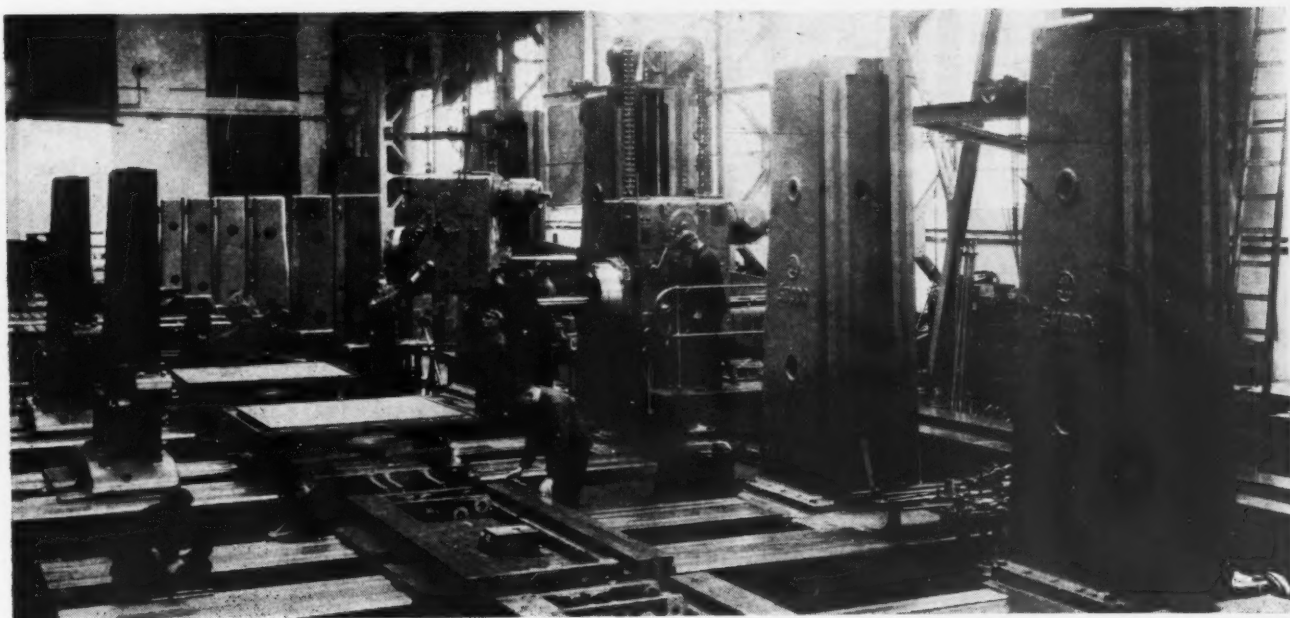
ONE MAN'S WORK: Here in a nutshell is the Ford story. At the left, the one-page \$93 payroll for the Ford Motor Co. for the week ended July 18, 1903, one week before the first car was completed. On the right, a small section of the file room containing Ford employee records today. Ford workers now total over 129,000; their daily payroll is about \$1.5 million.



Czechoslovakia's Skoda Works

MUNICH converted the efforts of 50,000 workers in the famous Czechoslovakian Skoda Works to production for the Nazis. Only 3 weeks before the war's end American and British bombers gave the Plzen works a terrific pasting. These photos show the Plzen works, 40 pct destroyed during the war, in their new role of producing for Czechoslovakia and Russia. Nationalization of Czech industry cut Skoda's mining, automotive and aviation branches loose from the company, but it opened up others: turbines, gasoline and diesel engines. The top photo shows the first completed freight locomotive leaving the shops. The center view is a new diesel powered shovel of the type being exported to Russia for reconstruction. Machine tools, bottom, are another Skoda product.

o o o



New Holding Company Acquires Steel Firms For Semi-Integration

New York

• • • The Fitzsimons Co., Youngstown, has been bought out by All American Industries, Inc., 35 Wall St., New York City, a newly organized holding company which in March bought out the Oklahoma Steel Castings Co., Tulsa, Okla.

The president of the new company is R. C. Hardy, partner in the law firm of Willkie-Owen-Otis-Farr & Gallagher located at the same address. Other officers include Kenneth M. Smith, vice-president and director; William S. Begg, secretary and director;

W. H. Diekman, treasurer; A. W. Benkert, director.

All American Industries contemplates further acquisitions in the steel industry and is currently engaged in negotiations with other producers toward this objective. The officers plan an overall expansion in the steel industry in order to develop a semi-integrated steel producing organization, each unit of which will market its products to another unit or to a single market, such as the petroleum industry, to be served by the holding company.

The holding company is not at present making any changes in executive or operating personnel in either of the two steel firms it has bought. It is probable that in the course of further acquisitions an

operating executive will be selected from one of the subsidiary companies and elevated to management of operations of all producing units.

In financing the operations of the holding company, 500,000 common shares have been authorized. When issued, capital resources should be some \$200 million.

The Fitzsimons Co., whose name has been changed by the action of the holding company to Fitzsimons Steel Co., is a cold-finished bar mill whose total annual capacity is reported as 45,700 net tons. Oklahoma Steel Castings Co. is a producer of electric furnace steel castings, principally for the oil and railroad industries. Its annual capacity is reported to be 8500 net tons.

AMERICAN IRON AND STEEL INSTITUTE SHIPMENTS OF STEEL PRODUCTS ALL GRADES INCLUDING ALLOY AND STAINLESS (Net Tons)

FEBRUARY - 1947

Month

Steel Products	Number of companies	Items	Current Month				To Date This Year				Whole Year 1946			
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale)		Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale		Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale)		Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale		Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale)		Shipments to Members of the Industry for Conversion into Further Finished Products or For Reale	
			(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	39	1	215,814	4.7	140,881	4.3	415,788	4.3	323,263	4.0	1,949,624	4.0	1,645,748	4.0
Structural shapes (heavy)	12	2	333,702	7.2	470	7.2	695,678	7.2	745	7.1	3,474,284	7.1	3,399	7.1
Steel piling	3	3	25,121	0.5	23	0.5	54,079	0.5	23	0.4	205,313	0.4	141	0.4
Plates (sheared and universal)	28	4	444,535	9.6	25,311	9.4	912,083	9.4	43,052	8.5	4,152,181	8.5	250,709	8.5
Skelp	5	5	12,447	0.3	23,588	0.3	26,131	0.3	62,943	0.5	227,033	0.5	194,666	0.5
Rails—Standard (over 60 lbs.)	4	6	175,281	3.8	155	4.0	388,581	4.0	155	3.7	1,790,311	3.7	4,890	3.7
—All other	5	7	15,226	0.3	2	0.3	28,629	0.3	24	0.3	144,999	0.3	426	0.3
Joint bars	7	8	15,695	0.3	623	0.3	30,268	0.3	1,982	0.4	176,803	0.4	5,327	0.4
Tie plates	8	9	29,487	0.6	560	0.7	72,839	0.7	1,375	0.9	447,496	0.9	18,700	0.9
Track spikes	8	10	13,215	0.3	10	0.3	27,497	0.3	10	0.3	146,194	0.3	693	0.3
Hot Rolled Bars—Carbon	32	11	474,860	10.3	58,747	10.3	998,929	10.3	131,130	10.3	5,006,859	10.3	707,991	10.3
—Reinforcing—New billet	15	12	98,855	2.1	628	2.0	191,963	2.0	1,358	2.1	1,048,483	2.1	7,381	2.1
—Rerolled	11	13	7,596	0.2	-	0.2	18,680	0.2	-	0.3	141,346	0.3	1,267	0.3
—Alloy	25	14	130,667	2.8	16,460	2.9	284,015	2.9	35,206	2.8	1,390,278	2.8	138,395	2.8
—TOTAL	43	15	711,378	15.4	75,835	15.4	1,493,587	15.4	167,694	15.5	7,586,966	15.5	855,034	15.5
Cold Finished Bars—Carbon	27	16	127,102	2.7	506	2.7	261,822	2.7	929	2.7	1,316,579	2.7	2,428	2.7
—Alloy	25	17	20,965	0.5	131	0.5	45,497	0.5	249	0.4	196,237	0.4	1,725	0.4
—TOTAL	33	18	148,067	3.2	637	3.2	307,319	3.2	1,178	3.1	1,512,816	3.1	4,153	3.1
Tool steel bars	19	19	7,426	0.2	363	0.2	15,918	0.2	730	0.2	96,020	0.2	371	0.2
Pipe & Tubes—Butt weld	14	20	121,044	2.6	4,669	2.6	248,158	2.6	9,787	2.6	1,276,289	2.6	45,593	2.6
—Lap weld	8	21	32,176	0.7	38	0.7	67,645	0.7	222	0.6	305,516	0.6	238	0.6
—Electric weld	11	22	70,313	1.5	833	1.4	134,475	1.4	1,842	1.4	674,459	1.4	591	1.4
—Seamless	11	23	149,260	3.2	9,000	3.3	324,982	3.3	22,608	3.8	1,871,540	3.8	83,441	3.8
—Conduit	6	24	9,705	0.2	534	0.2	19,488	0.2	1,244	0.2	98,521	0.2	2,448	0.2
—Mechanical and pressure tubing	12	25	45,979	1.0	1,237	1.0	101,051	1.0	2,758	0.9	429,180	0.9	3,478	0.9
Wire rods	20	26	41,709	0.9	14,430	1.0	101,267	1.0	34,707	1.4	679,998	1.4	346,506	1.4
Wire—Drawn	38	27	197,957	4.3	21,051	4.3	414,639	4.3	38,162	4.0	1,933,124	4.0	135,592	4.0
—Nails and staples	18	28	67,500	1.5	748	1.5	144,980	1.5	1,125	1.3	636,632	1.3	797	1.3
—Barbed and twisted	14	29	17,578	0.4	-	0.4	38,075	0.4	-	0.4	207,610	0.4	-	0.4
—Woven wire fence	13	30	29,703	0.6	344	0.7	65,294	0.7	666	0.9	383,230	0.9	-	0.9
—Bale ties	12	31	9,622	0.2	16	0.2	19,432	0.2	31	0.2	99,993	0.2	-	0.2
Black Plate—Ordinary	9	32	64,256	1.4	187	1.5	142,639	1.5	613	1.6	781,167	1.6	3,179	1.6
—Chemically treated	8	33	3,664	0.1	-	0.1	9,391	0.1	-	0.3	125,170	0.3	-	0.3
Tin and Terne Plate—Hot dipped	9	34	136,466	3.0	-	3.0	295,548	3.0	-	3.9	1,924,657	3.9	-	3.9
—Electrolytic	9	35	92,704	2.0	-	2.0	181,787	1.9	-	1.9	909,173	1.9	-	1.9
Sheets—Hot rolled	29	36	545,843	11.8	39,819	11.8	1,141,743	11.8	92,385	11.3	5,521,463	11.3	421,198	11.3
—Cold rolled	17	37	394,285	8.5	1,741	8.4	810,374	8.4	2,267	8.4	4,075,554	8.4	3,397	8.4
—Galvanized	16	38	114,594	2.5	24	2.6	254,530	2.6	44	3.0	1,462,053	3.0	1,725	3.0
—Electrical and enameling	10	39	38,754	0.8	48	0.9	88,473	0.9	247	0.9	433,170	0.9	-	0.9
Strip—Hot rolled	22	40	155,961	2.9	23,217	2.9	281,561	2.9	50,381	2.8	1,363,812	2.8	237,176	2.8
—Cold rolled	33	41	116,258	2.5	3,053	2.5	242,261	2.5	5,389	2.6	1,282,146	2.6	25,904	2.6
Wheels (car, rolled steel)	5	42	29,944	0.7	-	0.7	64,185	0.7	-	0.5	252,508	0.5	348	0.5
Axles	5	43	15,775	0.3	53	0.3	29,039	0.3	53	0.3	150,461	0.3	221	0.3
All other	-	44	-	-	-	-	-	-	-	-	6,266	-	-	-
TOTAL STEEL PRODUCTS	141	45	4,626,424	100.0	389,510	100.0	9,689,414	100.0	867,705	100.0	48,775,532	100.0	4,297,889	100.0

During 1946 the companies included above represented 99.3% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Adjusted.

Weekly Gallup Polls . . .

Public Names Chief Faults of Business Management

Princeton, N. J.

••• While frequently condemning strikes and criticizing the tactics of unions and union leaders, the American public by no means considers the gentlemen who sit on the other side of the bargaining table — employers — as faultless.

In fact, the general public thinks there are just about as many things wrong with employers as there are with unions, according to George Gallup, director, American Institute of Public Opinion.

This is shown in the results of a coast-to-coast survey in which voters were asked their opinions as to the chief faults of employers in this country. Respondents listed almost as many shortcomings in answer to this question as they did when asked a similar question about the faults of labor unions.

The chief complaint against employers was not what you might expect—low wages. To be sure complaints about wages ranked high up among the leading gripes.

But by actual count in the poll, more people named a broader, more inclusive fault. It is summed up in one reply from a white collar worker in a Pittsburgh steel company whose comment was typical of thousands in the survey:

"Management hasn't got enough understanding of working people and their problems. Businessmen keep thinking of labor as a 'commodity' instead of as human beings. The reason people join unions is because they feel that the boss won't pay any real attention to the welfare of the workers if left to himself. He's got to be forced to do things."

Another worker interviewed put his case this way:

"It isn't wages I'm complaining about. Sure, I'd like more pay, just like everybody else. But what gripes me more is the way they drive you. If you want to take the wife and kids on a vacation you get no pay. If you're half an

hour late to work you get docked. The washrooms stink. The company cafeteria serves rotten food. If the company would just stop and think that all us workers are human beings and want to be treated decently, I think they'd get more work out of us, and probably better work, too."

Throughout most of the faults listed by the public the general theme of lack of human understanding by employers recurred again and again.

The second fault of employers, in the eyes of the public, is that they don't want to pay enough in wages.

"They're greedy for profits," says a Manhattan textile worker, "and high wages cut down on profits. So they do all they can to beat you down and pay you as little as possible."

The next fault cited is that employers expect too much of their workers—that hours are too long and that production requirements per hour too stiff.

A fourth fault is that management doesn't reward ability. The argument here is that a man who does a good efficient job receives no more recognition than one who just does average work. Consequently, it is claimed, good workers lose initiative.

"There's no point in doing your best," says a Detroit machine tool worker, "because you don't get any more money. Might as well take it easy."

Failure to give bonuses for good work is singled out for specific mention by some people polled. Others criticize employers who have not set up pension funds to take care of their employees when they become too old to work.

Miscellaneous criticisms of employers include: Discrimination against women workers, refusal to give fair consideration to employee suggestions for improving machinery or operations, lack of honesty toward employees in showing profits, and attempts to weaken and undercut labor unions.

Vandenberg's Plan to Consult United Nations on Aid to Greece In Line With Public Sentiment

• • •

It seems clear that the general public finds many shortcomings in the behavior of management.

That is undoubtedly why surveys by the institute have always found large majorities believing in the idea of labor unions.

The right of workers to join together for collective bargaining has received majority support in repeated polls by the institute.

The fact that strikes are often unpopular with the general public does not signify that public opinion is against unions or against union attempts to rectify some of the faults of management as seen in the current survey.

••• Sen. A. H. Vandenberg's proposal for bringing the United Nations in on our program to aid Greece closely reflects the present attitude of the American people.

Ever since the discussion of helping Greece began, institute surveys have found the people anxious to see that the United Nations organization was not entirely bypassed. The Vandenberg amendment would give the UN power to review our actions in Greece and Turkey.

The first nationwide survey by the institute found that a substantial majority of voters wanted the problem of aiding Greece turned over to the UN. This did not mean that the country opposed having the United States take the initiative in giving aid to Greece.

Judging by an analysis of the ballots, it simply meant that people felt Washington should consult closely with the UN and should not take actions which a majority of UN members might disapprove.

The latest survey, just completed (CONTINUED ON PAGE 132)

John Sullivan to Head American Ceramic Group

Columbus, Ohio

••• John D. Sullivan, assistant to the director, Battelle Institute, Columbus, Ohio, will be installed as national president of the American Ceramic Society at the society's 49th annual meeting in Atlantic City, N. J. Installation ceremonies will be held at the annual dinner meeting on Apr. 23 during the convention.



John D. Sullivan

Mr. Sullivan, since 1931, has had executive responsibility for the research in ceramic technology conducted by Battelle Institute. Twice within recent years he has served as a national officer of the American Ceramic Society—as national treasurer in 1944-45 and as national vice-president in 1946.

J. W. Whittemore, Virginia Polytechnic Institute, will be installed as vice-president of the American Ceramic Society at the time of Mr. Sullivan's installation, and W. E. Cramer, Industrial Ceramic Products, Inc., Columbus, Ohio, will be the new treasurer of the organization.

The American Ceramic Society was founded in 1899 to promote the art, science, and technology of ceramics. It has a membership of more than 3500 and chapters throughout the country.

McKay Reports Net Profit

Youngstown, Ohio

••• McKay Machine Co. has reported net profit of \$180,917 for 1946 on net sales of \$1,778,449. Cost of goods sold was \$1,255,472 and selling expense totaled \$84,791. General and administrative expenses were \$127,875 and taxes other than income, \$21,998. Provision for federal taxes was \$112,124. McKay reported as of Dec. 31, current assets of \$913,678, against current liabilities totaling \$450,530. Last year the company paid \$53,339 in common and \$2320 in preferred dividends.

Lake Carriers' Assn. Elects J. Hutchinson President at Meeting

Cleveland

••• John T. Hutchinson has been elected president, Lake Carriers' Assn., by the board of directors at the association's annual meeting here. The new president is a partner in Hutchinson & Co., operators of the largest independent fleet on the lakes.

Mr. Hutchinson's elevation to the presidency came after A. T. Wood, vice-president, Wilson Transit Co., asked the 45 officials of the vessel operating companies which constitute the Lake Carriers' Assn board of directors to release him from the position he has filled for the past 9 years. In accepting Mr. Wood's resignation, the board unanimously elected him to their membership and to membership on the executive committee.

"The position which President Hutchinson takes over has grown in scope under the able handling of its responsibilities by Mr. Wood throughout the critical war period, during which the association's continued program or improvement has raised the capacity of the Great Lakes bulk cargo fleet to cope with current demands for volume movement of the raw materials of industry that promises this season to be the biggest in all peacetime history," according to the statement issued by the board of directors.

Throughout the critical period of Mr. Wood's presidency, the new administrative head of the Lake Carriers', John T. Hutchinson, served on the board of directors in which he has held active membership since 1935.

Reports Quarterly Net

New York

••• Barium Steel Corp. reports for the 3 months ended Mar. 31 consolidated net income of \$380,694, after all charges and after providing \$250,000 for estimated federal income taxes. Sales of the corporation were \$8,587,000, while unfilled orders at the close of the quarter totaled \$26,500,000. The earnings for the first quarter of this year compare with a loss of \$207,449 reported for the corresponding period of 1946.

Mather Resigns From Cleveland-Cliffs Iron

Cleveland

••• For reasons of health William G. Mather has resigned as chairman and member of the boards of directors of the Cleveland-Cliffs Iron Co. and the Cliffs Corp., and in deference to his wishes his resignation has been accepted by both boards.



William G. Mather

Mr. Mather, who observed his 89th birthday last September, became ill at his office several weeks ago and was taken to Lakeside Hospital. He has returned to his home. Up to the time of his illness he had been at his office daily, taking an active part in the companies' affairs.

Mr. Mather was president of the Cleveland-Cliffs Iron Co. from 1891 to 1933 and has been chairman of the board ever since. He entered the organization of the company in 1878.

Foreign Markets Neglected

Chicago

••• "Many manufacturers who now foresee a caught-up condition in their domestic deliveries are starting to look over the back fence towards those overseas markets they have neglected," said J. W. DeLind, Jr., president of Borg-Warner International Corp. Far-seeing manufacturers who allocated a part of their production to export trade after the war, Mr. DeLind declared, are today in a better position in the foreign market than those who did not, and find that their competitors are already entrenched.

The executive said, "Overseas distributors have been advertising and merchandising the names of the products which were made available to them at earlier dates and have built up consumer demand for those products." He went on to say, "That other countries have not been asleep is evidenced by the European-made radios and other products which I have seen."

Protests Entrance Of Large Steel Companies Into Erection Field

Washington

• • • Present indications are that conditions applying to structural shapes and forms will have leveled out sufficiently by the middle of the year so that smaller contractors will be in a vastly improved position, a steel subcommittee of the Senate Small Business Committee was told last week.

In many instances, C. A. Johnson, vice-president and general manager of sales for the Bethlehem Steel Co. fabrication division, told the committee that his corporation is able to quote to the government and others on the going price rather than on prices as of the time of delivery.

The subcommittee met to inquire into charges that through entrance into the erection field and by the method of bidding the large steel corporations are squeezing out the small contractors.

One of two complainants appearing before the subcommittee, Robert M. Koch, Karl Koch Erecting Co., protested entrance of the steel corporations in the erection field, declaring that it is becoming impossible for the small contractor to get contracts, to obtain steel, or to qualify under bidding terms for the veteran hospital construction program.

Mr. Johnson pointed out that his company had maintained an erection division for years and that while Bethlehem fabricates only about 12 pct of its own output, 52 pct of this fabrication goes to outside erectors. This, he added, is about the prewar ratio

and there is as much competition from small contractors now as before 1941, although the physical volume is less.

Furthermore, the Bethlehem executive said, his company's erection division has never bid on a job involving steel which the company itself did not furnish and fabricate. As far as refusing to supply independents was concerned, in view of the tight supply the steel company is continuing on a voluntary basis the allocation system instituted by the wartime WPB in 1940-41.

"We are trying to treat everyone alike," he said. "If an erector comes to us with a contract and wants steel, we give him a quotation."

Objections to terms of bids was based on the fact that the War Dept. asked for three types of bids on a New York project, to wit, (1) the overall job for furnishing, fabricating and erecting; (2) furnishing and fabricating; and (3)

the erecting. Awards would then be made to either the bidder in the first category or a combination of the second and third, whichever was lower.

Because Bethlehem needed work for its own erection division, the company bid only on the first and third classifications of bids, and since no independent fabricator bid, Mr. Koch contended, this had the effect of preventing his firm receiving the award since he could not obtain the necessary fabrication.

The supply of steel shapes is admittedly less than demand and the steel mills have already committed all of their available production for some time ahead, it was said.

Subcommittee Chairman Edward R. Martin, Rep., Pa., indicated that hearings, would be resumed to take up other complaints from small steel consumers, but did not set a definite date for the next meeting.

Addresses of Japanese, German Firms Available

Washington

• • • The War Dept. has announced that American business firms desiring names and addresses of Japanese and German business concerns should send inquiries direct to the Japanese Board of Trade, Tokyo, or to the Dept. of Foreign and Interzonal Trade, Minden, Germany.

Both theater agencies will supply, to the extent known, names and mailing addresses of firms within specific industries, as well as individual mailing addresses for specific concerns and other in-

formation of a nontransactional nature.

The full addresses of the two departments are:

Japanese Board of Trade
(Boeki Cho)
Ministry of Commerce and Industry
Tokyo, Japan

Main Department of Foreign and Interzonal Trade
Melitta House, Minden
Westphalia, Germany

Correspondence between American firms and firms in the occupied areas is limited to the extent that no transactional mail may be sent.

FIRST IN: Cleveland's first cargo of iron ore arrived on the Cleveland-Cliffs carrier, *Grand Island*, Apr. 11. Loaded at Escanaba, Mich., the 8000-ton cargo is being unloaded at the C&P dock and is consigned to the Republic Steel Corp.'s furnaces at Warren, Ohio.



Asks Free Depreciation By Revenue Dept. On Buying Machine Tools

Atlantic City, N. J.

••• The allowance of free depreciation by the Internal Revenue Dept. on purchases of machine tools and other productive equipment, as a practical method to assist small and medium sized manufacturers in capital financing, was suggested by Herbert H. Pease, president, National Machine Tool Builders Assn., and head of The New Britain Machine Co., New Britain, Conn., before the spring meeting of the association opening here.

Explaining that free depreciation means that the buyer is free to write off the cost of new productive equipment at time of purchase or over a schedule of years, at his option, Mr. Pease emphasized that free depreciation was allowed in Germany in prewar years and is today allowed in Sweden.

"In the economic crisis that I think we are in, in our country," he asked, "wouldn't this do more than anything else to modernize industry generally to the point

where costs could really be reduced and part of the difference passed on in the reduction of prices?

"If depreciation were taken all in one year, the cost to the Government would be only the delay of one year in taxes. There would be a natural brake on the amount a concern would put into new equipment based upon an estimate of the year's income subject to taxes," Mr. Pease said.

Reservations of exhibit space at the forthcoming Machine Tool Show have exceeded original estimates and the show will occupy well over 500,000 sq ft in the Dodge-Chicago plant, it was reported at the meeting by Swan E. Bergstrom, chairman of the show committee and sales manager of The Cincinnati Milling Machine Co. To be held in Chicago Sept. 17 to 26, it will constitute, Mr. Bergstrom said, "the largest single industry exhibit that has ever been attempted, either in this country or abroad."

James Y. Scott, chairman of the committee on government relations of the association and president of the Van Norman Co., Springfield, Mass., told members at the meeting that the machine

tool industry has recommended that government-owned machine tools for which there is no commercial demand be made available to schools more readily and at less cost than is now the case.

"The present procedure," Mr. Scott said, "is not only complex, but the price of 5 pct of the 'fair market value' is still more money than the schools can pay. We have strongly recommended that they be offered to schools at \$1 apiece."

He stressed the imperative necessity of setting aside a national reserve of idle machine tools to be held by the Armed Services as part of the defense program for the future.

Discussing the new tax outlook, Frederick S. Blackall, Jr., President of the Taft-Peirce Mfg. Co., Woonsocket, R. I.; Chairman of the association's committee on fiscal problems, pointed out that there is widespread confusion between rigid procedures such as 5-year amortization under necessity certificate, and the broad proposal that a greater degree of latitude be given the taxpayer whereby he can depreciate his capital assets on whatever plan or over whatever period is best suited to his particular situation.

"I am in considerable doubt," Mr. Blackall said, "in fact, as to whether many of us would want to depreciate our assets on a five-year basis. What we do want is the right to establish our own rates on any basis which is demonstrably reasonable in the light of our own business conditions."

Reports Big Order Backlog

Camden, N. J.

••• William P. Witherow, president of Blaw-Knox Co., told stockholders at the annual meeting that encouragement for the ensuing year can be taken from the largest and most diversified order book in the company's peacetime history. Unfilled orders at the end of the first quarter amounted to approximately \$32 million.

Although still acute, some improvement was reported in steel supply and this was reflected in improved first quarter operations. The gas shortage, however, and scarcities in other materials and equipment had limited some of the production activities.

Coming Events

- Apr. 28-29 American Zinc Institute, annual meeting, St. Louis.
- Apr. 28-May 1 American Foundrymen's Assn., convention, Detroit.
- Apr. 29-May 1 Industrial Packaging and Materials Handling Exposition, Industrial Packaging Engineers Assn. of America, Chicago.
- May 5-6 National Welding Supply Assn., convention, Philadelphia.
- May 12-15 American Steel Warehouse Assn., annual meeting, Los Angeles.
- May 15-17 Society for Experimental Stress Analysis, annual meeting, Chicago.
- May 21-22 American Iron & Steel Institute, annual meeting, New York.
- May 26-27 Assn. of Iron & Steel Engineers, annual spring conference, Philadelphia.
- May 27 Metal Powder Assn., spring meeting, New York.
- June 2-4 American Gear Manufacturers, Hot Springs, Va.
- June 5-7 Electric Metal Makers Guild, Inc., annual meeting, Pittsburgh.
- June 9-11 American Coke & Chemical Institute, annual meeting, French Lick, Ind.
- June 15-19 American Society of Mechanical Engineers, semiannual meeting, Chicago.
- June 16-20 American Society for Testing Materials, annual meeting, Atlantic City, N. J.
- June 17-19 Machinery Dealers National Assn., convention, Cincinnati.
- June 23-27 American Electroplaters Society, industrial finishing show, Detroit.
- July 14-18 American Society of Civil Engineers, Duluth, Minn.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, Inc., Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Cleveland.
- Sept. 29-Oct. 3 American Gas Assn., San Francisco.

The London **ECONOMIST**

Reparations and the Russian People

WHAT does the Russian "man in the street" feel about the international situation, and quite especially about the tension between his country and the Western Powers? Does any public opinion exist in Russia? And, if so, does it exert any influence on the government's foreign policy?

Under the single party system that has existed in Russia for several decades now there are obviously no direct clues to what the popular mind is thinking; and such trends of thought as exist among the politically minded must remain latent and cannot crystallize into distinct viewpoints and formulas.

It is, for instance, inconceivable that a Soviet Mr. Wallace should appear in Moscow, denounce Mr. Molotov's conduct of foreign policy and propose an alternative line. This much is obvious—but it is very little indeed. Yet, to assume for this reason that Russian public opinion does not weigh at all in the formulation of Russian foreign policy would be erroneous.

In his "Prelude to the Russian Campaign" M. G. Gafencu, a former Roumanian Ambassador in Moscow, has given an interesting account of how, between 1939 and 1941, popular discontent with the Russo-German pact of nonaggression showed itself in all sorts of subtle ways; and of how this made the foreign observer aware that the usual official claim that the Soviet people were united behind the government's foreign policy was a mere pretense.

There have been several other important instances in which it was not so difficult to see either that a cleavage between official policy and the popular mood was impending or that a particular line in the government's policy had an exceptionally strong popular appeal.

The Moscow conference of the Foreign Ministers undoubtedly stands in the center of the Russian public's interest, just as did the previous diplomatic gatherings; and it seems that it is not even overshadowed by the many economic difficulties that have been

hindering Russia's reconstruction.

Gone are the days when foreign affairs were reported by the national newspapers in short dispatches at the bottom of the last page, so that in the public's eyes they dwindled into insignificance compared with the latest record of a Stakhanovite in the Donetz Basin, or with the increase in the yield of milk of one collectivized cow in a farm of the Altai Province.

In recent months, the conferences of Foreign Ministers and the debates of the Security Council have occupied perhaps 50 pct—or even more—of the space in the national newspapers, which is considerably more than in the press of any western country. The law of diminishing news returns from a protracted diplomatic conference that has been overwhelming news editors all over the world has had no influence at all on the Russian press. The press and propaganda departments of party and government have been determined to make the diplomatic battles loom before the eyes of the Russian people as large as possible; and in this they have undoubtedly succeeded.

THE public that has had its gaze fixed on the diplomatic scene has not yet overcome its own very acute postwar malaise. Victory had evoked great hopes, most of which have been dashed. The standard of living has not greatly improved since the war; and in many areas it has gravely deteriorated. The magnitude of the price that Russia has paid for victory has really impressed itself on the minds of rulers and ruled alike only since the first flush of victory passed. Amid the holocaust of war, national unity had been achieved to an extent unknown before.

In making their prodigious sacrifices the mass of the Russian people had taken it for granted that they had now deserved the trust of their own government as well as of their western Allies; that after victory the rigors of the régime would be so relaxed by the government as to allow them some

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taste of freedom; and that they would be helped back to their feet by sympathetic and grateful allies. The malaise has been aggravated by the experiences of millions of Russians beyond their own frontiers who have had their eyes opened to the higher standards of living and the greater freedom that even the vanquished peoples have been enjoying.

The expectations of greater freedom at home could not be altogether ignored by the government, even though they have been firmly determined not to give in on any essential point. Thus, the Supreme Soviet at its recent session promised to promulgate something like a statute of habeas corpus; and to carry out a revision of the criminal code that would at least protect the Soviet citizen against lawless and arbitrary exercise of authority.

Only time can show whether, or to what extent, this promise will be made good. The dilemma that confronts the rulers is not unfamiliar—can an autocracy of its own accord evolve towards some degree of liberalism? The answer that historical precedent offers is in some ways inconclusive. But at present the issue is more symptomatic than actual: It reflects the desire of the government to free itself up to a point from blame for the oppressive conditions under which the Russian people have still to live.

The oppression of economic misery is, after all, the worst of all. It has, of course, been made graver by last year's drought, the *force majeure* for which even the most sullen malcontent cannot blame the government, and to



Machine Tool Show to Be Biggest Industrial Event Ever Seen

Cleveland

• • • Planned during the political and economic uncertainty of the postwar period, one of the most important events in the annals of metalworking will take place in Chicago, Sept. 17-26, when the Machine Tool Show plays host to the leading manufacturers of the world.

Sponsored by the National Machine Tool Builders' Assn., the Machine Tool Show will be the biggest industrial show ever seen in this country, occupying a total floor area of 513,000 sq ft or about 12 acres, in the Dodge-Chicago plant, probably the only plant in the country capable of housing an industrial show of such proportions.

Actual booth area, excluding aisles, will total 331,000 sq ft, or more than twice the floor space occupied by the 1935 Machine Tool Show. Machine tool exhibits will occupy more than 80 pct of this space, with services and accessories taking up the balance.

More than 250 companies, including producers of small, portable equipment and builders of the biggest machine tools, will be represented. Virtually every type of machine tool produced in the

**Will Occupy Floor Space Of
513,000 Sq Ft; 250 Firms
To Be Represented**

• • •

By BILL LLOYD
Cleveland Regional Editor

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United States will be on display, from standard, general purpose machines to the special machines designed for a specific mass-production job.

The Dodge-Chicago plant, located some 10 miles from the Chicago downtown area, has floors capable of supporting the heaviest machines, ample power to permit actual operation of every machine under full load, and all other facilities required for the operation of machine tools under simulated working conditions. About 900 machines were under power at the 1935 show.

Preliminary estimates place attendance at 100,000, including visitors from all over the world, which will require all hotel facilities in the Chicago area, comprising some 14,000 rooms. There

were about 60,000 in attendance at the 1935 Show. Special arrangements are being made to operate a line of busses on schedule from downtown Chicago to the show during open hours. Plans are also being made to set up an airplane commuter service between Milwaukee, Detroit, Indianapolis and other cities and Chicago. The Dodge-Chicago plant is close to the Chicago Municipal Airport. Admission will be by invitation.

Machine tool builders have been preparing for this show, which has for its theme the National Machine Tool Builders' Assn. slogan, "More goods for more people at lower cost," since 1945. But as H. H. Pease, NMTBA president and president of New Britain-Gridley Division, New Britain Machine Co., has put it, "Throughout the war period there was constantly building up under the stress of that remarkable experience, knowledge as to possible techniques which would represent substantial improvement in performance."

"As long as the war lasted, it was impossible to bring such new developments and techniques past the drawing board stage. With the advent of peace, however, machine

tool builders have been hastening to put them into effect. The machines to be displayed at the forthcoming show represent 7 years' cumulative advances in the art of removing metal."

Qualified observers predict that all of the new equipment exhibited at the 1947 show will evidence the trend toward higher production and greater automaticity. Some machines displayed will be completely redesigned models of old standbys; many will be completely new, featuring electronics to a great extent.

Net effect of the 1947 Machine Tool Show may parallel that of the 1935 show in getting world production back on its feet. For many years, economists have pointed out that there is no prosperity in this country while the machine tool curve is down. By use of new machines, manufacturers will once again be able to attain the volume that means lower costs and lower prices.

Following the 1935 show, the industry had to rebuild itself from the bottom, and 1936 saw the first construction of plant additions of any size in the machine tool industry since 1929; today the industry has ample capacity for any peacetime requirement.

Arrangements for the 1947 show have been the responsibility of the show committee, consisting of Swan E. Bergstrom, sales manager, The Cincinnati Milling Machine Co.; William L. Dolle, president, Lodge & Shipley Co.; R. W. Glasner, president, Clearing Machine Corp.; Helge G. Hoglund, vice-president, Van Norman Co.; Ralph J. Kraut, president-general manager, Giddings & Lewis Machine Tool Co.; Donald M. Pattison, vice-president, Warner & Swasey Co., and Louis Polk, president, The Sheffield Corp.

The Machine Tool Congress will be held concurrently with the show and various Chicago hotels are to be designated as headquarters for the participating organizations. Associations assisting in arranging the program of speakers for these meetings and technical sessions, which are open to all registered visitors at the show, include: American Bolt, Nut & Rivet Manufacturers Assn., American Foundrymen's Assn., American Machine Tool Distributors' Assn., American Society of Mechanical Engineers, American So-

ciety of Tool Engineers, Chicago Technical Societies Council, National Electrical Manufacturers' Assn., Society of Automotive Engineers, and the National Machine Tool Builders' Assn.

Three previous NMTBA shows have been held, all in Cleveland, in 1927, 1929 and 1935. A show was planned for 1939 and was ready to go, but the outbreak of the war brought national defense into sharp focus and machines which would have been shown then became part of the war effort.

Trends in machines at the 1935 show, which proved to be a stimulant itself to all industry, included trimness, savings in floor space, obvious improvement in appearance, rapidity and accuracy of production, greater convenience of operation, accessibility of tooling, machines were heavier and more rigid, with higher speeds and greater power, shafts were larger, ground gears, use of anti-friction bearings increased, automatic lubrication systems, generous coolant supply and large chip space, big machines with fingertip or push-button control, power-

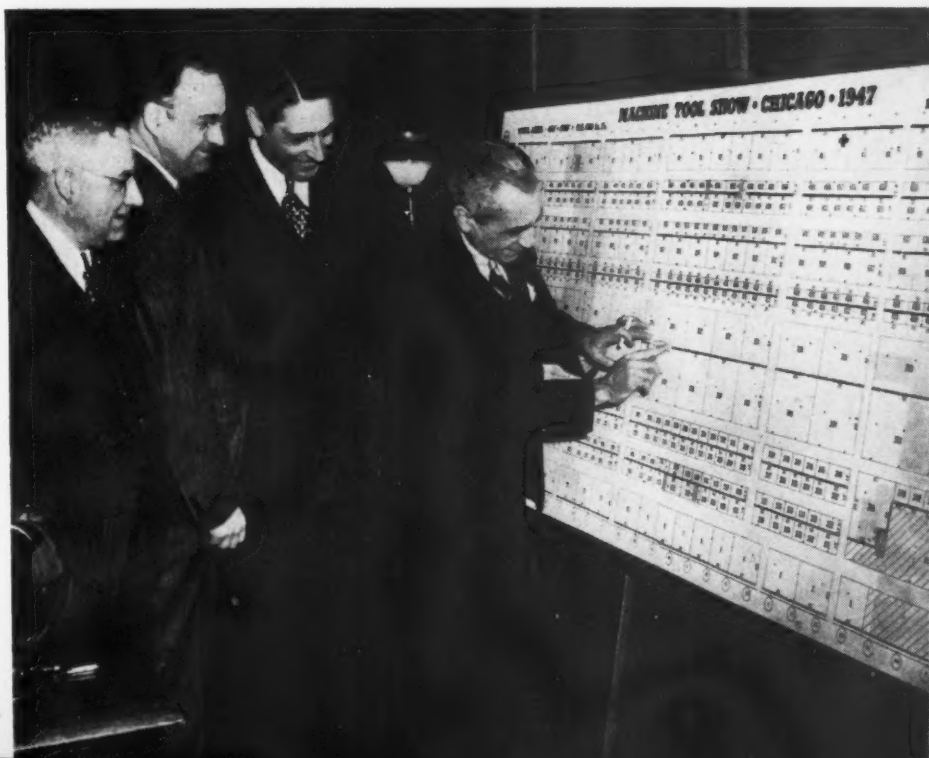
actuated chucks, more extensive use of hydraulics.

Some observers look upon 1935 as the turning point of acceptance in popular understanding of machinery improvements as a boon to the people of the country; in 1947, with labor unions growing steadily stronger and more aggressive, the machine tool builders' course is clear.

So salutary was the effect of the 1935 Machine Tool Show that NMTBA was awarded the American Trade Executive Award for "the outstanding achievement by a trade association during the last three years, the staging of the 1935 machine tool show (was) . . . one of the definitely successful moves toward business recovery . . . the leaders of this association (NMTBA) did not wait for more favorable conditions . . . they set out to create more favorable conditions through their own efforts, thus displaying that courage which should be typical of American business endeavors. . ."

Such was the tribute paid the machine tool industry by Daniel C. Roper, Secretary of Commerce, in May 1936.

AFTER THE BOWL WAS OVER: Location of exhibit space for various machine tool companies at the coming machine tool show was established by drawing numbers from a goldfish bowl. Shown here are several tool company and show officials staking out an exhibit space. They are (left to right) Ray F. Ingram, vice president and secretary, Landis Tool Co., D. M. Pattison, vice-president in charge of sales, Warner & Swasey Co., Swan E. Bergstrom, sales manager, Cincinnati Milling Machine Co., and Truman L. Clapp, Clapp & Poliak, Inc., the firm which is managing the tool show. Mr. Bergstrom is serving as chairman of the show committee.



Industrial Briefs . . .

• **TO HEAD GROUP**—Albert Goldman, vice-president and general manager of the Atlantic Mfg. Co., Philadelphia, has been elected president of the Philadelphia Tool & Die Manufacturers Assn.

• **BUYS TOOL BUSINESS**—Consolidated Machine Tool Corp., Rochester, N. Y., announced acquisition of the machine tool division of William Sellers & Co. Inc. of Philadelphia. Entire manufacturing and sales facilities of the Sellers firm will be moved to Rochester and it will bear the name of William Sellers & Co. Division, Consolidated Machine Tool Corp.

• **MOVES DISTRICT OFFICE**—Carbide & Carbon Chemicals Corp. has moved its Los Angeles district office to 416 W. Eighth Street, Los Angeles 14.

• **BRAZILIAN OFFICE**—Independent Pneumatic Tool Co., Chicago, manufacturer of pneumatic and electric tools has announced the opening of a technical office at Sao Paulo, Brazil. Reuben P. Rudy will be manager of the new office.

• **ELECTED OFFICER**—Leslie C. Thellemann, Buffalo, has been elected by the board of directors to the position of executive vice-president of the Steel Founders' Society of America. Headquarters of the society are located in Cleveland.

• **BUYS TOOL COMPANY**—The Sheffield Corp., Dayton, Ohio, gage manufacturers, has exercised its option to buy the Murchey Machine & Tool Co. of Detroit. O. A. Ahlers, sales manager and director, and Albert Polk, vice-president and director of the Dayton firm, will manage the Detroit business.

• **PLOW COMPANY SOLD**—The Madison Plow Co., Madison, Wis. has been purchased by a group of Madison industrialists including D. R. Ellis, vice-president and general manager of the firm, A. P. Jensen, Frank O. Redick and P. M. Fairchild.

• **K-F AGREEMENT**—Kaiser-Frazer has signed an agreement with RFC, acting by and through the WAA under which the automobile company has the option of extending its present lease on the Willow Run plant for 18 years up to Dec. 31, 1965. K-F has also leased the Willow Run "spare parts" building. Leasing of the additional building brings the K-F rental up to \$1,050,000 in 1947 and \$1,400,000 in 1948 and thereafter.

• **CONTRACT AWARD**—A contract for the construction of a \$1 million addition to the General Fireproofing Co.'s plant in Youngstown has been awarded to Joseph Bucheit & Sons Co., according to an announcement by Walter Bender, president of General Fireproofing.

• **PRICE REDUCTION**—One of the first important postwar price reductions by a major parts manufacturer was announced by the Cleveland Graphite Bronze Co. The reduction will save purchasers approximately \$2,500,000 a year on Graphite's present volume of business, it was stated. It applies to most of the company's automotive engine bearings and to a substantial part of its bushing line.

• **FOUNDRY RENOVATION**—A \$500,000 renovation and improvement program for the gray iron foundry of Babcock & Wilcox Co.'s plant at Barberton, Ohio, has been announced by company officials. The program calls for improvements to the building, new machinery and new equipment.

• **NEW MACHINE FIRM**—The Whiton Machine Co. has just been organized in Connecticut and has acquired the business and properties of the D. E. Whiton Machine Co., of New London, Conn., manufacturers of steam turbine engines, automatic gear cutting machines, centering machines and lathe chucks.

Number of Processors Of Iron and Steel Up 64.7 Pct Since 1939

New York

• • • The number of establishments using iron and steel was 64.7 pct greater in 1946 than in 1939, according to data prepared by the U. S. Dept. of Commerce, the American Iron & Steel Institute reported.

Approximately 33,600 establishments were processing iron and steel in 1946 against 20,400 in 1939, an increase which was almost double the average rate of gain experienced by all types of manufacturing industries.

The largest group of steel processors is identified as the "machinery, except electrical group" which expanded to 15,700 in mid-1946, an 86.8 pct gain over September 1939. The group, "iron and steel and their products," showed a 39.5 pct growth during the same interval, rising to 11,300 establishments. Establishments in the "electric machinery" category increased 106 pct to 3500. The number of firms in the "automobiles and auto equipment" group increased one-third to 1600, while "other transportation equipment" showed a 50 pct gain to 1500 establishments.

The government's category, "iron and steel and their products," includes iron and steel foundry products; metal stampings; tin cans and other tinware, cutlery, tools and hardware; heating apparatus and plumbing supplies; fabricated structural steel and ornamental metal work; and miscellaneous iron and steel products. The sub-group of "blast furnaces, steel works, and rolling mills" is a very small segment of the group.

The "automobiles and auto equipment" group includes motor vehicle makers and parts producers. The "other transportation equipment" category includes railroad equipment, aircraft and parts, shipbuilding, and motorcycles, bicycles and parts.

The "machinery, except electrical" group, includes makers of engines and turbines, agricultural machinery and tractors, construction, mining and oilfield machinery and tools, metalworking machinery, and other types of industrial machinery.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 1600 Tons, Mishawaka, Ind., twin branch plant extension for Indiana and Michigan Electric Co. to American Bridge Co., Pittsburgh.
- 1075 Tons, Dolton, Ill., Pennsylvania R.R. grade separation to Bethlehem Steel Co., Bethlehem, Pa.
- 620 Tons, Thornton, Ill., Calumet Parkway grade separation to Bethlehem Steel Co., Bethlehem, Pa.
- 335 Tons, Norristown, Pa., Schmidt Brewery Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 300 Tons, Alberta, Mich., state highway bridge to American Bridge Co., Pittsburgh.
- 240 Tons, Calumet City, Ill., Burnham Ave. grade separation to Bethlehem Steel Co., Bethlehem, Pa.
- 140 Tons, Philadelphia, Heintz Mfg. Co., building, to Bethlehem Fabricators Co., Bethlehem, Pa.
- 100 Tons, Philadelphia, City of Philadelphia, Sedgely Ave. bridge, to Bethlehem Steel Co., Bethlehem, Pa.

• • • Fabricated steel inquiries this week included the following:

- 4500 Tons, Los Angeles, office building for Prudential Insurance Co. of America.
- 2200 Tons, Port Washington, Wis., Unit No. 4 power plant.
- 750 Tons, Hampton, N. H., New Hampshire Dept. of Highways, bridge, May 1.
- 575 Tons, Chicago, North State St. viaduct.
- 260 Tons, Clearfield County, Pa., Pennsylvania Dept. of Highways, bridge, to be rebid on Apr. 25.
- 200 Tons, South Bend, Ind., building for S. M. Nielsen Co.
- 180 Tons, Buffalo, United Engineers & Constructors, Inc., addition, to building, bids in.
- 120 Tons, Newport, Del., E. I. du Pont de Nemours Co., building, Apr. 28.

• • • Reinforcing bar awards this week included the following:

- 1000 Tons, Chicago, Commonwealth Edison power plant, through Paaschen, contractor, to Ceco Steel Products Corp., Omaha, Neb.
- 380 Tons, San Mateo Co., Calif., four overcrossings, Bayshore Freeway between South San Francisco and Burlingame, through Carrico and Gautier, to Bethlehem Pacific Coast Steel Corp., San Francisco.

• • • Reinforcing bar inquiries this week included the following:

- 500 Tons, Hot Springs, S. D., Fall River channel improvements.
- 360 Tons, Los Angeles, grade separation on Hollywood Parkway between Vineland and Barham, California Div. of Highways, Los Angeles, bids to May 15.
- 230 Tons, Marshfield, Wis., sewage plant.
- 220 Tons, Monticello, Ind., highway bridge No. 2803. All bids rejected.
- 170 Tons, Freeport, Ill., Furst McNess building.
- 125 Tons, Casper, Wyo., bars for Kortess Power Plant, Bureau of Reclamation, Denver, Inv. 19,552-A, bids to Apr. 23.
- 120 Tons, Moline, Ill., housing project.

• • • Piling awards this week included the following:

- 150 Tons, Chicago, Commonwealth Edison power plant to Carnegie-Illinois Steel Corp., Pittsburgh.

• • • Railroad car awards this week included the following:

American Car & Foundry Co., New York, has received the following orders for freight car

equipment: Chicago & North Western Ry. Co.—1000 50-ton steel box cars, and the Chicago, St. Paul, Minneapolis & Omaha Ry. Co.—400 50-ton steel box cars.

• • • Railroad car inquiries this week included the following:

The New York Central R.R. is inquiring for 2000 50-ton 40-ft box cars.

Columbia Steel Names New Production Heads

San Francisco

• • • As sheet production at the Pittsburg, Calif., mills of Columbia Steel Co. dwindles under the handicaps imposed by installation of new cold-reduction facilities scheduled for fourth quarter operation, the company announced appointment of eight superintendents and foremen for the new mills.

Joseph A. White, plant superintendent announced the following appointments: D. E. Rice, division superintendent; D. W. Lasell, assistant division superintendent; C. C. Morgan, superintendent, cold-reduction department; J. P. Newman, superintendent, sheet finishing department; J. H. Clark, superintendent, tin finishing department; W. L. Clark, general foreman, cold reduction department; Melvin Rush, general foreman, hot dip tinning department; and George Jedenoff, general foreman, electrolytic tinning department.

It is anticipated that sheet production at Pittsburg will be shut down completely for from 4 to 6 months while the new facilities are completed. Date of this work stoppage will depend on availability of components required for the expansion.

Group Flies to Study Prospects in Europe

Washington

• • • Thirteen American industrialists and business executives left here by plane last week as guests of Secretary of War Robert P. Patterson for a visit to Europe, where they will survey industrial and export conditions of the British and American zones in Germany and the American zone in Austria. Included in the official party were:

T. E. Millsop, president of the Weirton Steel Co.; Leigh Willard,

president of the Interlake Iron Corp.; George H. Johnson, president of the Gisholt Machine Co.; E. J. Thomas, president of the Goodyear Tire & Rubber Co.; Gibson Carey, Jr., president, Yale & Towne Mfg. Co.; Leslie Browne, president of Lenox, Inc.; Herman E. Cone, president, Proximity Mfg. Co.; Albert Creighton, chairman, Boston Federal Reserve Bank; M. H. Eisenhart, president of Bausch & Lomb Optical Co.; Les-sing J. Rosenwald, former board chairman, Sears, Roebuck & Co., and Ames Stevens, president, Whittier Mills.

Amos E. Taylor, director of the Bureau of Foreign and Domestic Commerce, accompanied them.

Leaving Washington Apr. 17, the group planned to fly direct to Berlin for a conference with General Clay, military governor, and other officials. The party planned to then proceed to Vienna and Munich for inspection of manufacturing plants in Bavaria.

Following inspections at Wiesbaden and the I. G. Farben plants at Hoechst, the group will split into two parties—one visiting Essen and Hamburg in the British Zone and the other, Stuttgart and other cities in the American zone.

Lake Ore Consumption Up

Cleveland

• • • Consumption of Lake Superior iron ore by U. S. and Canadian blast furnaces rose to 6,979,204 gross tons in March, compared to 6,264,284 tons in February and 6,021,018 tons in March, 1946, according to the monthly report of the Lake Superior Iron Ore Assn.

Cumulative consumption of Lake Superior iron ore this year totaled 20,267,344 gross tons Apr. 1, as compared with cumulative consumption of 11,488,445 tons Apr. 1, 1946.

Stocks of iron ore on hand at furnaces and Lake Erie docks totaled 17,411,010 tons Apr. 1, compared to 24,316,980 tons a month ago and 27,601,106 tons Apr. 1, 1946.

Blast furnaces depending principally on Lake Superior iron ore numbered 167 in the U. S. and seven in Canada Apr. 1, with 16 U. S. furnaces and three Canadian furnaces idle. On Mar. 1, active furnaces numbered 168 in the U. S. and eight in Canada.

MACHINE TOOLS

... News and Market Activities

March Machine Tool Shipments Advance 7.5 Pct Over February

••• Reversing the downtrend of the past three months, machine tool shipments rose to \$26,200,000 in March, a 7½ pct increase over February, according to preliminary estimates.

New firm orders, despite the spottiness of the purchasing pattern, also made an upward spurt, reaching \$19,500,000, a preliminary total which is expected to be somewhat higher when a final tabulation can be made. Percentage-wise, new firm orders increased about 16 pct over February. Foreign firm orders accounted for \$5,270,000 of the total.

Cancellations support the increase in new firm orders, dropping to \$1,400,000 in March, from \$1,700,000 in February. Unfilled firm orders continued to decrease at approximately 6 pct per month rate, dropping to \$138 million as of Mar. 31.

Regardless of the industry's March performance, sources in the trade report that business is still very spotty. Engine lathes, gear cutting machines, and some of the drilling machines are a few of the items in some demand.

In Detroit, producers of perishable tools report a fairly active, although tapering, demand for their products. Several firms making highly specialized tools and equipment indicate backlogs up to one year, although standard equipment sales are practically at a standstill in the face of WAA's active efforts to liquidate the huge surpluses piled high in Detroit warehouses. WAA is using quarter pages in Detroit papers to attract attention to their machine tool bargains.

There are few indications that important new tooling decisions will be made by automobile manufacturers in the face of uncertainties about labor and mounting tooling costs. Most sources indicate that the new tooling by automobile companies will be postponed until the last possible moment.

New Firm Orders Increase 16 Pct; Unfilled Orders, Cancellations Drop

Two conditions favoring an active market for tools are the high cost of labor and substantial orders for some types of equipment by foreign buyers.

Deliveries of most types of equipment appear to be reasonably close to schedule and inquiries have subsided noticeably within the last month. According to most observers, little change is expected in existing conditions until uncertainties about labor and prices are dispelled and the introduction of new models is considerably further advanced than at present.

Wage negotiations between Detroit tool and die manufacturers and union representatives are currently in progress.

In Cincinnati, the machine tool market continues slow with the greatest emphasis being placed on the coming Machine Tool Show in the fall. The opinion of builders in this area is that the show will do a great deal to overcome the trend of automobile builders toward buying war surplus machine tools. New machinery, designed to cut operating expenses, will be ordered to speed up building programs for 1948 and 1949, according to sources in the industry here. Foreign business is only holding its own in the Cincinnati area.

Monarch Machine Tool Co. reports net profits for March quarter of \$194,320, equal to 92¢ a share, compared with \$124,397 or 59¢ a share in the same quarter of 1946. Chairman Wendell E. Whipp says while sales and earnings were considerably larger in 1947 first quarter than last year, shortages of materials last year interfered seriously with production. He said

fully 25 pct of the working force had to be laid off during intervals of 1946 because of lack of materials.

Deliveries of electrical equipment, once a machine tool builders' bottleneck, are still far from immediate. A recent survey reveals that fractional horsepower motors are being quoted at 23 months; 1 to 15 three-phase, 60 weeks; machine tool controls, mechanical, standard, immediate; engineered, up to 50 weeks; electronic controls, 20 to 60 weeks, depending on the engineering involved.

Consolidated Machine Tool Corp., Rochester, N. Y., has announced the acquisition of the machine tool division of William Sellers & Co., Inc., Philadelphia. According to Consolidated Machine Tool Corp. officials, the entire manufacturing, sales and service facilities of William Sellers & Co. will be moved to Rochester, in the near future, and will bear the name of William Sellers & Co. Division of Consolidated Machine Tool Corp.

More than 1000 representatives of the machine tool industry and other interested trade groups have attended the exhibit of German machine tools at Frankford Arsenal, Philadelphia, since the exhibit opened March 31, according to an announcement by the Office of Technical Services, Department of Commerce.

Sponsored jointly by OTS and the Office of the Chief of Ordnance, War Dept., the National Machine Tool Builders' Assn. and the Army Ordnance Assn., the exhibit will remain open through May 2.

Major interest at the exhibit centers around a precision grinding machine which has an optical system permitting the operator to compare his work with the engineering drawing as the work proceeds. The machine was used in Germany for making templates, cylindrical forms and other complicated shapes.

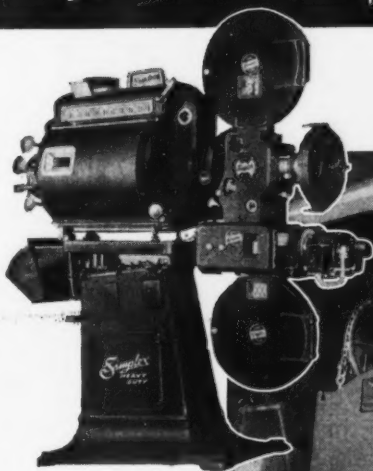
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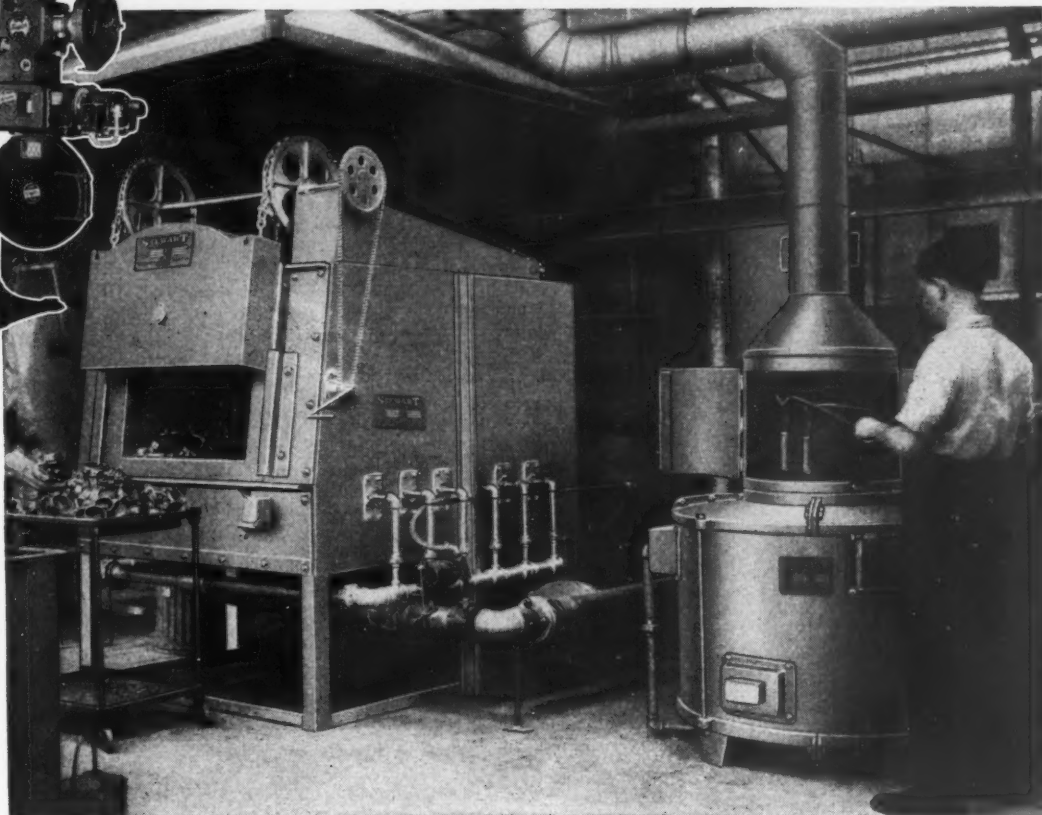
THE BEST INDUSTRIAL FURNACES MADE

For HEAT TREATING PRECISION PARTS

at INTERNATIONAL PROJECTOR CORPORATION, BLOOMFIELD, N. J.



The hairline accuracy for the countless small parts used in the compact mechanism of International's Simplex Projector, shown above, required a heat treatment to close tolerances to prevent unnecessary scrapping of complicated parts. At left, a Sunbeam Stewart Semi-Muffle Oven being loaded with castings; at right, workman removing work from a Sunbeam Stewart Liquid Heat Treating Furnace.



One example of the close tolerances that must be met in the manufacture of the Simplex Projector is the "star wheel" that provides the movement of the projector. This critical part is held to .005" after heat treatment before grinding. For the exacting heat treating requirements of the countless small parts used in their compact mechanism, International Projector uses standard Sunbeam Stewart equipment throughout for normalizing, stress relieving, and high-speed tool steel heat treating.

Two Sunbeam Stewart Semi-Muffle Oven Furnaces and Two Round Pot Furnaces, one used for hardening, the other for tempering, enable International Projector to do work that formerly was sent out to commercial heat treaters. With the installation of this equipment, the quality and uniformity of work was held to International's close requirements.

This installation is typical of the standard industrial heat-treating furnaces Sunbeam Stewart builds every day to meet the requirements of manufacturers all over the country. Sunbeam Stewart engineers will be glad to work with you on your heat treating requirements.

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NONFERROUS METALS

... News and Market Activities

Blast Did Not Damage Texas City Tin Smelter

New York

... Reports from Texas City, Tex. indicate that the government tin smelter, estimated to be three to four miles from the blasted dock area, did not suffer from the recent explosion, except for the loss of glass. Shipments of tin have been made from the plant since the explosion and loading started again on Monday. Since the switching facilities were not damaged, the only effect of the blast in reducing production is in the temporarily demoralized condition of the working force and a possible shortage of hydrochloric acid, of which there is said to be a month's reserve on hand. The smelter has been receiving high grade concentrates from the Netherlands East Indies, the contract specifying 25 pct of 1947 production together with the backlog from last year's agreement. Therefore it is expected that the off-grade production of tin reported from Texas City as recently as December should show considerable improvement.

Tin Study Group Meets

Washington

... Arrival in Brussels of the United States delegation for a meeting looking to the formation of an International Tin Study Group has been announced by the State Dept.

Headed by Delegate Donald D. Kennedy, chief of the Department's International Resources Division, the advisory members of the delegation are:

Karl L. Anderson, assistant

chief of the State Dept. International Resources Division; H. C. Bugbee, attache, American Embassy, London; John J. Croston, deputy director of the former Metals and Minerals division, CPA; Carl Ilgenfritz, vice president in charge of purchases, U. S. Steel Corp; and Charles W. Merrill, chief of the Metal Economics division, Bureau of Mines.

The meeting is the culmination of an agreement reached at the World Tin Conference in London last October, the Department said. It was felt that such a study group is needed in order to maintain a continuous intergovernmental review of the world tin situation.

Other nations scheduled to take part in the tin study group include the United Kingdom, The Netherlands, Bolivia, France, Belgium, China and Siam.

Copper, Zinc Output Down

Ottawa

... While production of copper and zinc in Canada showed a decline in January, output of nickel was at the highest level since August 1945. The decline in copper and zinc output was largely due to labor troubles which closed down Noranda Mines, Canada's largest copper producer, and also affected zinc mining operations in Quebec.

January copper production amounted to 14,315 tons compared with 15,164 tons in December and 16,010 tons in January 1946.

Zinc production in January amounted to 17,531 tons, down from 18,536 tons in December and 20,367 tons in January last year. Exports of zinc spelter in Jan-

uary totaled 20,398 tons against 12,814 tons in December, while zinc in ore exported amounted to 3590 tons in January against 6659 tons in the previous month.

Nickel output for January totaled 9729 tons as compared with 8494 tons in the preceding month and 6911 tons in January 1946.

French Find Molybdenum

Paris

... Molybdenite was discovered in the Vosges Mountains in France at the beginning of the war, and molybdenum was extracted from lead ore in Tillot and at Chateau-Lambert. About 100 tons of molybdenite was mined with a content of 0.3 pct molybdenum during the war. Study is being made to determine whether current production would pay. Discovery of molybdenum is also reported in Czechoslovakia at Krupka in the region of Teplitz.

Remelt Aluminum Drops

New York

... With the market for secondary aluminum in the doldrums, some producers have taken the initiative and lowered prices on most grades by 1/2¢ per lb. The aluminum scrap market has been recently reported as softening somewhat in price which has permitted the current ingot price reductions. However, most grades of aluminum ingot are still priced above virgin ingot.

Copper Suspension Closer

Washington

... Legislation suspending the copper import duty, excluding copper sulfate, for a 2-year period was passed by the Senate Monday and sent back to the House for agreement. The House is expected to concur in the copper sulfate amendment and send the bill to the President for signature this week.

Nonferrous Metals Prices

Cents per pound

	Apr. 16	Apr. 17	Apr. 18	Apr. 19	Apr. 21	Apr. 22
Copper, electro, Conn.....	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.....	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York.....	80.00	80.00	80.00	.....	80.00	80.00
Zinc, East St. Louis.....	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis.....	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex. ..	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	\$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	\$27.50
Cadmium, del'd	\$1.75
Cobalt, 97-99% (per lb)	\$1.50 to \$1.57
Copper, electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz. ..	\$35.00
Indium, 99.8%, dollars per troy oz. ..	\$2.25
Iridium, dollars per troy oz.	\$110.00
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$88.00 to \$90.00
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$63 to \$66
Silver, New York, cents per oz.	75.625
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	\$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	21.50
No. 120	21.90
No. 123	20.50
80-10-10 ingot	
No. 305	25.25
No. 315	23.50
88-10-2 ingot	
No. 210	23.25
No. 215	27.25
No. 245	23.75
Yellow ingot	
No. 405	17.00
Manganese Bronze	
No. 421	19.25

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	17.00
0.60 copper, max.	16.25-16.75
Piston alloys (No. 122 type)	15.00-15.25
No. 12 alum. (No. 2 grade)	14.50
108 alloy	14.75
195 alloy	15.25-15.50
AXS-679	14.75
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1-85 pct-97½ pct	15.50
Grade 2-92 pct-95 pct	14.50
Grade 3-90 pct-92 pct	13.75
Grade 4-85 pct-90 pct	13.25

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	36%
Electrodeposited	31%
Rolled, oval, straight, delivered ..	32½%
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33
Zinc, Cast, 99.99	18%
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver, 999 fine	
Rolled, 1000 oz lots, per oz.	88½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	40.50
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz ..	70%
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 52S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2¼ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb, f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, \$1.25-\$1.31; 24, \$1.71-\$1.75.

Round Rod, Square and Hexagonal Bar: M, diam, in. ¼ to ¾, 55¢; ¾ to 1, 52.5¢; 1 to 4 in. and over, 52¢. Other alloys higher.

Extruded Solid Shapes and Rectangles: M, form factors 1 to 4, 52¢; 3 to 10, 53.5¢; 14 to 16, 56.5¢; 20 to 22, 61¢; 26 to 28, 68¢. Other alloys higher.

Tubing: M, based on weight in pounds per lineal foot, 2 lb. and over, 55¢; 1 to 1.5, 58.5¢; 0.5 to 0.7, 64¢; 0.35 to 0.4, 69¢; 0.25 to 0.3, 73¢; 0.15 to 0.2, 81¢; 0.085 to 0.10, 96¢; 0.05 to 0.06, \$1.14; 0.04 to 0.045, \$1.28. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	41	
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, L.c.I.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	32.78		32.93
Copper, hot rolled.	29.28		
Copper, drawn	30.28		
Low brass	39.13	30.32	30.63
High brass	32.30	29.58	29.89
Red brass	39.74	30.93	31.24
Naval brass	28.73	27.48	33.42
Brass, free cutting	27.23	23.64	
Commercial bronze	40.86	32.05	32.36
Manganese bronze	32.28	30.78	36.92
Phosphor bronze, 5 pct.		50.98	50.75
Muntz metal	23.42	27.17	31.61
Everdur, Herculey			
Olympic, etc	36.30	34.80	37.71
Nickel silver, 5 pct.	40.54	39.53	37.92
Architectural bronze	27.23		

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

Copper and Brass

No. 1 heavy copper and wire	16½-17
No. 2 heavy copper and wire	15½-16
Light copper	14½-14¾
Auto radiators (unsweated)	11-11½
No. 1 composition	13½-14
No. 1 composition turnings	13½-14
Clean red car boxes	12-12½
Cocks and faucets	11-11½
Mixed heavy yellow brass	8½-9
Old rolled brass	9½-10
Brass pipe	10½-11
New soft brass clippings	12½-13
Brass rod ends	13½-13¾
No. 1 brass rod turnings	13-13½

Aluminum

Alum. pistons free of struts ..	5½-6
Aluminum crankcases	7-7½
2S aluminum clippings	8-9
Old sheet & utensils	7-7½
Mixed borings and turnings ..	2-2½
Misc. cast aluminum	7-7½
Dural clips (24S)	4½-4¾

Zinc

New zinc clippings	7½-8
Old Zinc	5½-6
Zinc routings	2½-2¾
Old die cast scrap	3½-4

Nickel and Monel

Pure nickel clippings	19½-20½
Clean nickel turnings	16½-17½
Nickel anodes	19½-20½
Nickel rod ends	19-20
New Monel clippings	14-15
Clean Monel turnings	9-10
Old sheet Monel	12-13
Old Monel castings	10-11
Inconel clippings	10-11
German silver clippings, mixed ..	10½-11
German silver turnings, mixed ..	7-7½

Lead

Soft scrap lead	12½-13
Battery plates (dry)	7½-7¾

Miscellaneous

Block tin	67-68
No. 1 pewter	50-52
No. 1 auto babbitt	40-43
Mixed common babbitt	13½-14
Solder joints	15½-16
Siphon tops	40-42
Small foundry type	16½-17
Monotype	14-14½
Lino and stereotype	13½-14
Electrotype	11½-12
New type shell cuttings	11½-12
Clean hand picked type shells ..	5½-6
Lino and stereo dross	5½-6
Electro dross	3½-4

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.	
Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point ..	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

Sharp Price Declines Sweep Most Markets

New York

• • • Heavy melting steel scrap prices were down again this week—down sharply. This is the point the scrap trade was anxiously watching: the time when many mill contracts ran out and new orders had to be placed. Early this week few new orders had been booked, but at least one—in Pittsburgh—was signed for 5000 tons at a figure that sent the average heavy melting steel price there down \$5.25. This is one of the largest price breaks in scrap market history.

In every other major market in the nation—the West Coast excepted—prices also skidded: the No. 1 steel average was off \$4 in Buffalo and \$3 in Philadelphia and Birmingham. Cleveland and Youngstown posted \$2 declines though Chicago was off only 50¢ early in the week. If New York brokers can fill new orders taken on Monday afternoon at anything like they hope to pay, prices there will be off about \$4.

Price declines in the cast grades were more noticeable this week. Most major markets reported the No. 1 cast price down somewhat. In Pittsburgh it was off \$1.25; in Chicago the drop was \$3; in Philadelphia \$2.50.

In addition to closer mill scrutiny of grading there are signs that there will soon be a differential for those grades below Nos. 1 and 2 which have long been lumped together as heavy melting steel.

PITTSBURG—The sale of 5000 tons of heavy melting scrap pegged the price of scrap here this week at \$32 to \$32.50. The settlement of the steel wage contract may bolster the market slightly, but observers feel that it will only postpone the decline rather than stop it. Mills here are holding back and some brokers feel that the market may decline to as low as \$30 a ton on heavy melting by the end of the week. While there was no sales activity in most grades, the drop in heavy melting is reflected in the price for these items. The railroad grades are priced on the basis of the last sale, but actually they would not bring these prices this week if such scrap was offered on the market. Malleable scrap is being quoted at \$44 to \$45 but demand is high and supply is low. It is conceivable that a tonnage of a good grade

of malleable could bring as much as \$53 to \$55 a ton. One broker here was offering \$38 for low phos, indicating that this market has also softened.

CHICAGO—Fair tonnage closed last week at 50 cents off the old price but generally new business was at a standstill. Dealers yards are bare and mill inventories have been greatly improved. For the first time in years the mills see a chance to dictate the new price which if not too low will be quickly accepted by the trade. Brokers for the most part only took new material if the scrap was loaded ready to go. Next week the new price is expected to be set. None of the mills have indicated that it will be although others are guessing at \$30.00.

PHILADELPHIA—An order for heavy melting scrap placed by one eastern consumer has dropped that grade \$3 a ton to a range of \$30 to \$31. The first significant recent drop in cast prices brings cupola and clean auto down to \$45 to \$46 and heavy breakable and charging box to \$41 to \$42. There was some downward readjustment of turnings prices, with mixed borings and turnings dropping \$2. Mills report that scrap receipts continue in heavy volume on old orders.

NEW YORK—The week opened with average heavy melting steel prices down \$2.50 on purchases for old orders. By Monday afternoon at least two firms had new orders which they expected to be able to cover in the neighborhood of \$27. No. 1 cast dropped \$2 during the past week. Early in the week turnings were not showing the same weakness as cast but a drop was expected although one buyer planned to hold prices until the end of the month.

DETROIT — The Detroit market is definitely weaker with scrap plentiful in practically all grades but few takers. Reports reaching Detroit of large tonnages piling up at the various steel centers have added a bearish tone to a market already badly confused by rapid changes taking place during the past few weeks. The largest buyer in this area is accepting delivery at \$32 until the end of April but there are no indications as to what action will be taken at the expiration of the present agreement. Flow of scrap has been large with at least one broker reporting the heaviest monthly volume in history. Meanwhile, inspection has been tightened and a number of rejections of cast grades have been reported as well as a weakening of the cast price structure.

CLEVELAND—Most consumers in this area are still out of the market and major buying centers around earmarked material which some consumers are not too anxious to take. Shipments are still good, but somewhat under the levels of the past few weeks, with the old orders running out. The malleable market is

very strong, with about five consumers clamoring for every car and prices being paid are fluctuating accordingly.

BOSTON — Trade finally finds itself with nobody to ship to. Big users refuse to take scrap. As a result, prices are on the skids and off \$2 to \$3 for the week. Busheling has taken the hardest rap. It is \$25 to \$26 a ton, as against \$29 to \$31 a week ago, as was heavy steel. At worst, heavy steel today is \$27 to \$28 or \$2 more than busheling. Fortunately, from a price standpoint, floating scrap supply is relatively small. The cast market holds serenely at \$40 to \$45 locally.

BUFFALO—Heavy melting steel continued on the skids this week slipping \$4 a ton, and turnings dropped \$2. One major consumer bought openhearth material at \$30 to \$31 on a limited scale, while another leading interest was reported out of the market until May 15. Weakness in steel grades pushed No. 1 cupola \$2 to \$3 lower and quotations on rails specialties were labelled nominal.

CINCINNATI — With foundries fairly well supplied and mills generally resisting purchases the scrap market is weaker. While steel mills are not too well supplied with scrap, they are in sufficient shape to keep up operations, and are resisting further purchases. Material seems to be in modestly good quantity, and dealers and brokers are wary of being caught short.

BIRMINGHAM—The market trend here is downward with some representative purchases of No. 1 heavy melting steel being made at \$30 per ton delivered, a drop of \$3. Very large tonnages of all types of material still are being offered but buying is cautious and limited.

ST. LOUIS—Shipments of scrap iron to the St. Louis industrial district continue heavy, and offerings for May delivery are being declined by the mills, who will not set the pattern for next month until after Apr. 30. Mills have been able to add to their stockpiles during this month. Railroad lists; St. Louis-San Francisco, 32 carloads and Missouri-Kansas-Texas 5 carloads.

TORONTO — Minor improvement taking place in scrap iron and steel receipts in the Canadian markets is doing little to improve the short supply situation. Steel mills and foundries are maintaining high production schedules, but only by larger use of pig iron. Mills still have some scrap in stock but withdrawals have been heavy as deliveries to the big consumers are less than 20 pct of requirements. Foundries report that it is almost impossible to pick up cast scrap and stove plate and dealers state that these materials are appearing on the market only at irregular intervals and then tonnages are small. Offerings from rural districts have not started to appear although dealers look for fairly good tonnages from outside points starting early in May.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.00 to \$32.50
RR. hvy. melting	37.50 to 38.00
No. 2 hvy. melting	32.00 to 32.50
RR. scrap rails	42.00 to 43.00
Rails 2 ft. and under	46.00 to 47.00
No. 1 comp'd bundles	32.00 to 32.50
Hand bld. new shfs	32.00 to 32.50
Hvy. axle turn	31.00 to 31.50
Hvy. steel forge turn	31.00 to 31.50
Mach. shop turn	27.00 to 28.00
Short shov. turn	29.00 to 30.00
Mixed bor. and turn	27.00 to 28.00
Cast iron borings	27.00 to 28.00
No. 1 cupola cast	44.50 to 45.00
Heavy breakable cast	30.00 to 31.00
Malleable	44.00 to 45.00
RR. knuck. and coup.	44.00 to 45.00
RR. coil springs	44.00 to 45.00
Rail leaf springs	44.00 to 45.00
Rolled steel wheels	44.00 to 45.00
Low phos	38.00 to 40.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.50 to \$33.00
No. 2 hvy. melting	32.50 to 33.00
No. 1 bundles	32.50 to 33.00
No. 2 dealers' bundles	32.50 to 33.00
Bundled mach. shop turn	32.50 to 33.00
Galv. bundles	30.50 to 31.00
Mach. shop turn	27.50 to 28.00
Short shov. turn	29.50 to 30.00
Cast iron borings	28.50 to 29.00
Mix. borings & turn	27.50 to 28.00
Low phos. hvy. forge	38.00 to 38.50
Low phos. plates	35.50 to 36.00
No. 1 RR. hvy. melt.	33.00 to 34.00
Rerolling rails	38.00 to 39.00
Miscellaneous rails	36.50 to 37.50
Angles & splice bars	39.00 to 40.00
Locomotive tires, cut	41.00 to 41.50
Cut bolster & side frames	38.00 to 38.50
Standard stl. car axles	38.50 to 39.00
No. 3 steel wheels	37.50 to 38.50
Couplers & knuckles	38.00 to 38.50
Malleable	47.00 to 50.00
No. 1 mach. cast	40.00 to 41.00
Rails 2 ft. and under	41.00 to 42.00
No. 1 agricul. cast	38.50 to 39.00
Hvy. breakable cast	35.00 to 35.50
RR. grate bars	38.50 to 39.00
Cast iron brake shoes	38.50 to 39.00
Cast iron carwheels	39.00 to 40.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	30.00 to 31.00
Mach. shop turn	24.00 to 25.00
Shoveling turn	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Mixed bor. & turn	24.00 to 25.00
Low phos. plate	37.00 to 38.00
No. 1 cupola cast	43.00 to 45.00
Hvy. breakable cast	34.00 to 35.00
Scrap rails	38.00 to 39.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	27.00 to 28.00
Nos. 1 and 2 bundles	27.00 to 28.00
Busheling	25.00 to 26.00
Turnings, shovelings	21.00 to 22.00
Machine shop turn	19.00 to 20.00
Mixed bor. & turn	19.00 to 20.00
Cl'n cast. chem. bor.	21.00 to 23.00
No. 1 machinery cast	40.00 to 45.00
No. 2 machinery cast	40.00 to 45.00
Heavy breakable cast	40.00 to 45.00
Stove plate	40.00 to 45.00

DETROIT

Per gross, ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	\$29.50 to \$30.00
No. 2 hvy. melting	29.50 to 30.00
No. 1 bundles	29.50 to 30.00
New busheling	29.50 to 30.00
Flashings	29.50 to 30.00
Mach. shop turn	22.50 to 23.00
Short shov. turn	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Mixed bor. & turn	23.50 to 24.00
Low phos. plate	31.50 to 32.00
No. 1 cupola cast	37.00 to 38.00
Hvy. breakable cast	29.00 to 31.00
Stove plate	33.00 to 35.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	30.00 to 31.00
Mach. shop turn	24.00 to 25.00
Shoveling turn	25.00 to 26.00
Mixed bor. & turn	22.00 to 23.00
Clean cast chemical bor.	30.00 to 31.00
No. 1 cupola cast	45.00 to 46.00
Hvy. breakable cast	41.00 to 42.00
Cast. charging box	41.00 to 42.00
Clean auto cast	45.00 to 46.00
Hvy. axle forge turn	30.00 to 31.00
Low phos. plate	37.00 to 38.00
Low phos. punchings	37.00 to 38.00
Low phos. bundles	35.00 to 36.00
RR. steel wheels	38.00 to 39.00
RR. coil springs	38.00 to 39.00
RR. malleable	50.00 to 52.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$33.50 to \$34.50
Bundled sheets	32.00 to 32.50
Mach. shop turn	22.00 to 23.00
Locomotive tires, uncut	36.00 to 37.00
Mls. std. sec. rails	37.00 to 38.00
Rerolling rails	37.50 to 38.50
Steel angle bars	39.00 to 40.00
Rails 3 ft. and under	41.00 to 43.00
RR. steel springs	38.00 to 38.50
Steel car axles	38.00 to 39.00
Stove plate	36.00 to 38.00
Grate bars	35.00 to 36.00
Brake shoes	35.00 to 36.00
Malleable	47.00 to 49.00
Cast iron car wheels	42.00 to 43.00
No. 1 machinery cast	40.00 to 41.00
Breakable cast	36.00 to 37.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	\$29.00 to 30.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.00 to 30.00
Long turnings	23.00
Shoveling turnings	25.00
Cast iron borings	24.00
Bar crops and plate	32.00 to 33.00
Structural and plate	32.00 to 33.00
No. 1 cast	37.00 to 39.00
Stove plate	35.00 to 36.00
Steel axles	33.00
Scrap rails	30.00 to 31.00
Rerolling rails	36.00 to 37.00
Angles & splice bars	32.00 to 33.00
Rails 3 ft. & under	32.00 to 33.00
Cast iron carwheels	32.00 to 32.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.50 to \$33.00
No. 2 hvy. melting	32.50 to 33.00
Low phos. plate	38.00 to 38.50
Mach. shop turn	26.50 to 27.00
Short shov. turn	28.50 to 29.00
Cast iron borings	28.50 to 29.00
Elec. furnace punch	38.00 to 38.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$28.00 to \$28.50
No. 2 hvy. melting	28.00 to 28.50
Comp. black bundles	28.00 to 28.50
Comp. galv. bundles	26.00 to 26.50
Mach. shop turn	20.50 to 21.00
Mixed bor. & turn	20.50 to 21.00
Shoveling turn	21.50 to 22.00
No. 1 cupola cast	40.00 to 41.00
Hvy. breakable cast	40.00 to 41.00
Charging box cast	40.00 to 41.00
Stove plate	40.00 to 41.00
Clean auto cast	40.00 to 41.00
Unstrip. motor blks	38.00 to 39.00
Cl'n chem. cast bor.	24.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	30.00 to 31.00
Mach. shop turn	22.00 to 23.00
Shoveling turn	24.00 to 25.00
Cast iron borings	22.00 to 23.00
Mixed bor. & turn	22.00 to 23.00
No. 1 cupola cast	38.00 to 42.00
Charging box cast	29.00 to 30.00
Stove plate	30.00 to 35.00
Clean auto cast	38.00 to 42.00
Malleable	45.00 to 47.00
Low phos. plate	33.00 to 35.00
Scrap rails	32.00 to 35.00
Rails 3 ft. & under	40.00 to 43.00
RR. steel wheels	40.00 to 43.00
Cast iron carwheels	40.00 to 43.00
RR. coil & leaf spgs	40.00 to 43.00
RR. knuckles & coup.	40.00 to 43.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.50 to \$31.00
No. 2 hvy. melting	30.50 to 31.00
Compressed sheet stl.	30.50 to 31.00
Drop forge flashings	30.50 to 31.00
No. 2 bundles	30.50 to 31.00
Mach. shop turn	26.00 to 26.50
Short shovel	27.00 to 27.50
No. 1 busheling	30.50 to 31.00
Steel axle turn	30.50 to 31.00
Cast iron borings	27.00 to 27.50
Mixed bor. & turn	27.00 to 27.50
No. 1 machinery cast	40.00 to 42.00
Malleable	55.00 to 60.00
RR. cast	40.00 to 41.00
Railroad grate bars	37.00 to 38.00
Stove plate	37.00 to 38.00
RR. hvy. melting	35.00 to 35.50
Rails 3 ft. & under	42.00 to 43.00
Rails 18 in. & under	43.00 to 44.00
Elec. furnace punch	36.00 to 36.50

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn	13.00
Elec. furn. 1 ft. und.	25.00
No. 1 cupola cast	\$32.00 to 33.00
RR. hvy. melting	20.50

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 1 bales	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn	14.50
No. 1 cupola cast	\$35.00 to 36.00
RR. hvy. melting	30.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melting	\$30.00
Elec. furn. 1 ft. und.	24.00
No. 1 cupola cast	29.00
RR. hvy. melting	11.00

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*
* Ceiling price	

Comparison of Prices . .

Advances over past week in Heavy Type, declines in Italics. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(cents per pound)				
Hot-rolled sheets	2.50	2.50	2.50	2.425
Cold-rolled sheets	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip	2.50	2.50	2.50	2.35
Cold-rolled strip	3.20	3.20	3.20	3.05
Plates	2.65	2.65	2.65	2.50
Plates, wrought iron	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00

Fin and Terneplate:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(dollars per base box)				
Tinplate, standard cokes.	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30

Bars and Shapes:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(cents per pound)				
Merchant bars	2.60	2.60	2.60	2.50
Cold-finished bars	3.20	3.20	3.20	3.10
Alloy bars	3.05	3.05	3.05	2.92
Structural shapes	2.50	2.50	2.50	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	24.00
Wrought iron bars	6.15	6.15	6.15	4.76

Wire and Wire Products:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(cents per pound)				
Bright wire	3.30	3.30	3.30	3.05
Wire nails	3.75	3.75	3.75	3.25

Rails:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(dollars per 100 lb)				
Heavy rails	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails	2.85	2.85	2.85	49.18*

Semifinished Steel:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(dollars per gross ton)				
Rerolling billets	\$42.00	\$42.00	\$42.00	\$39.00
Sheet bars	50.00	50.00	50.00	38.00
Slabs, rerolling	42.00	42.00	42.00	39.00
Forging billets	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43

Wire Rods and Skelp:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(cents per pound)				
Wire rods	2.55	2.55	2.55	2.30
Skelp	2.35	2.35	2.35	2.05

Pig Iron:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(per gross ton)				
No. 2, foundry, Phila.	\$36.51	\$36.51	\$36.51	\$28.34
No. 2, Valley furnace	33.50	33.50	33.50	26.50
No. 2, Southern, Cin'ti.	34.75	34.75	34.75	26.94
No. 2, Birmingham	29.88	29.88	29.88	22.88
No. 2, foundry, Chicago†	33.00	33.00	33.00	26.50
Basic, del'd eastern Pa.	36.92	36.92	36.92	27.84
Basic, Valley furnace	33.00	33.00	33.00	26.00
Malleable, Chicago†	33.50	33.50	33.50	26.50
Malleable, Valley	33.50	33.50	33.50	26.50
Charcoal, Chicago	45.99	45.99	45.99	42.34
Ferromanganese†	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
‡ For carlots at seaboard.

Scrap:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(per gross ton)				
Heavy melt'g steel, P'gh.	\$32.25	\$37.50	\$41.00	\$20.00
Heavy melt'g steel, Phila.	30.50	33.50	40.25	18.75
Heavy melt'g steel, Ch'go	32.75	33.25	37.25	18.75
No. 1, hy. comp. sheet, Det.	29.75	30.75	35.00	17.32
Low phos. plate, Youngs'n	33.25	39.25	44.25	22.50
No. 1, cast, Pittsburgh	44.75	46.00	44.50	20.00
No. 1, cast, Philadelphia	45.50	48.00	50.00	20.00
No. 1, cast, Chicago	40.50	43.50	46.50	20.00

Coke, Connellsville:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(per net ton at oven)				
Furnace coke, prompt	\$10.50	\$9.00	\$9.00	\$7.50
Foundry coke, prompt	11.25	10.25	10.25	9.00

Nonferrous Metals:	Apr. 22, 1947	Apr. 15, 1947	Mar. 25, 1947	Apr. 23, 1946
(cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	12.00
Copper, Lake, Conn.	21.625	21.625	21.625	12.00
Tin, Straits, New York	80.00	80.00	70.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	8.25
Lead, St. Louis	14.80	14.80	14.80	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 93 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL	Apr. 22, 1947
One week ago	2.86354¢ per lb.
One month ago	2.86354¢ per lb.
One year ago	2.73011¢ per lb.

HIGH	LOW
1947.... 2.86354¢	2.86354¢
1946.... 2.83599¢ Dec. 31	2.54490¢ Jan. 1
1945.... 2.44104¢ Oct. 2	2.38444¢ Jan. 2
1944.... 2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943.... 2.29176¢	2.29176¢
1942.... 2.28249¢	2.28249¢
1941.... 2.43078¢	2.43078¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930.... 2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	SCRAP STEEL
.....\$33.15 per gross ton.....	.....\$31.83 per gross ton.....
.....\$33.15 per gross ton.....	.....\$34.75 per gross ton.....
.....\$33.15 per gross ton.....	.....\$39.50 per gross ton.....
.....\$26.12 per gross ton.....	.....\$19.17 per gross ton.....

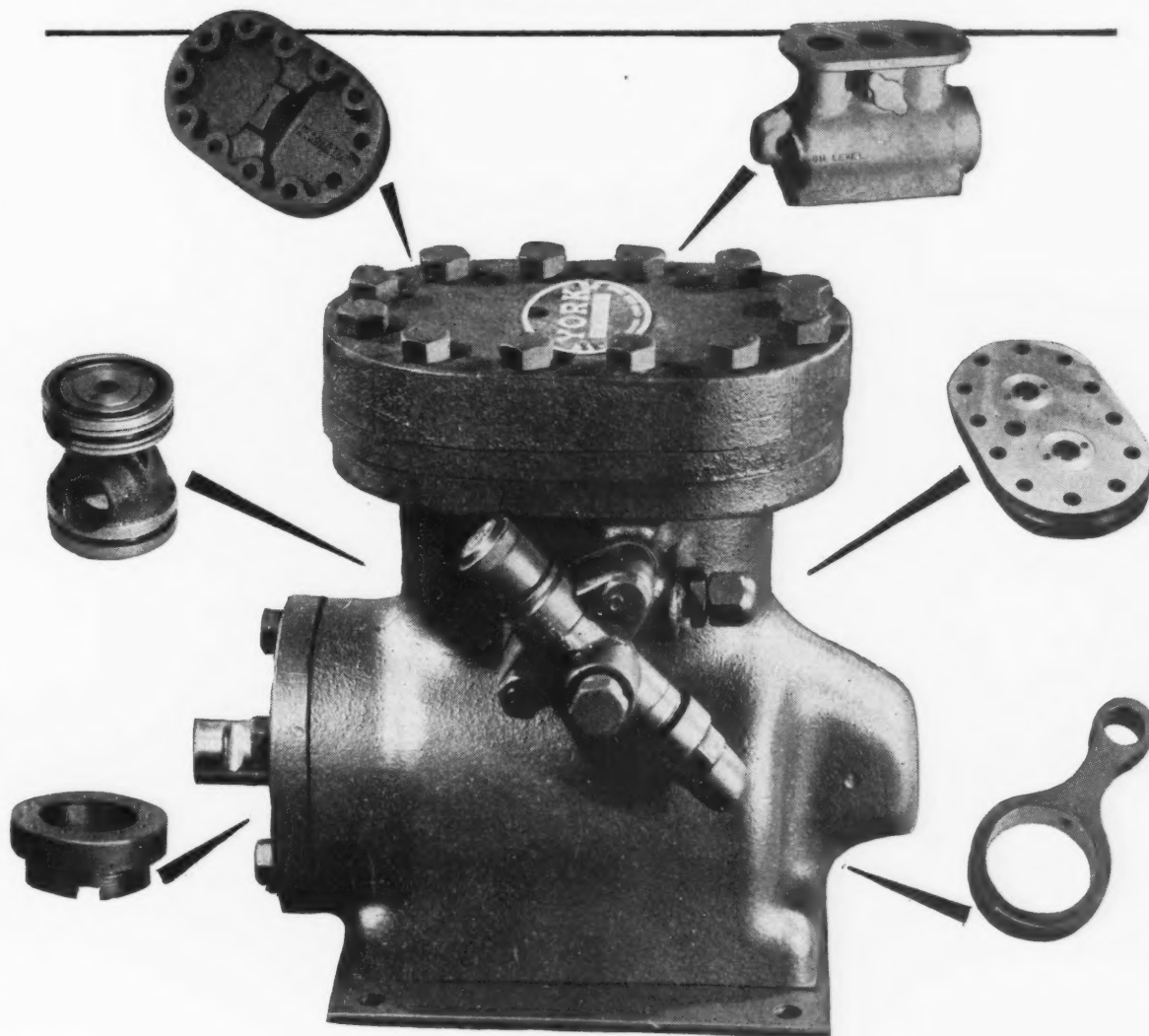
HIGH	LOW	HIGH	LOW
\$33.15 Mar. 11	\$30.14 Jan. 7	\$39.67 Mar. 18	\$31.00 Jan. 7
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24
23.61	23.61	\$19.17	\$19.17
23.61	23.61	19.17	19.17
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 8	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

YORK ASSURES DEPENDABILITY

...WITH NICKEL CAST IRON



A "Freon-12" compressor made by York Corp., the world's largest builder of air conditioning and cooling equipment. All individual parts shown above are made of Nickel cast iron.

York compressor castings, made of Nickel cast iron, are characterized by high strength, excellent wear resistance and pressure tightness. In addition, the dense, homogeneous, fine-grained structure of Nickel cast iron is readily machinable.



Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes and other alloys containing Nickel. This information and data are yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N. Y.

THE IRON AGE, April 24, 1947—119

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) This base price for annealed, bright finish wire, commercial spring wire. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6 (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices; includes 3 pct freight tax. (15) 0.035 to 0.075 in. thick by 3/4 to 3 1/2 in. wide. (16) Some producers are charging 2.76c. (17) Delivered Los Angeles; add 1/2c per 100 lb for San Francisco. (18) Delivered Los Angeles only. (19) Fabricated.

Basing Points	DELIVERED TO											
	Pitts- burgh	Chicago	Gary	Cleve- land	Bir- mingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	San Francisco, Los Angeles, Seattle	Detroit New York Phila- delphia
INGOTS												
Carbon, re-rolling												
Carbon, forging	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00					
Alloy	\$52.00											
BILLETS, BLOOMS, SLABS												
Carbon, re-rolling	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00					\$45.00
Carbon, forging billets	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00					\$53.00
Alloy	\$61.00	\$61.00				\$61.00						\$64.00
SHEET BARS							\$53.00			Portsmouth, Ohio=\$67.20		
PIPE SKELP	2.35¢	2.35¢					2.35¢	2.35¢		(Coatesville=2.35¢)		
WIRE RODS	2.55¢	2.55¢		2.55¢	2.55¢						3.27¢ ¹³	
SHEETS												
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.67¢	2.50¢	3.24¢ ¹⁷	2.65¢ 2.79¢ 2.70¢
Cold-rolled ¹	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢			3.35¢ 3.61¢ 3.58¢
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢		4.32¢ ¹⁷	3.84¢ 3.75¢
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢			3.70¢ 3.95¢ 3.93¢
Long ternes ² (10 gage)	3.55¢	3.55¢	3.55¢									3.95¢ 3.91¢
STRIP												
Hot-rolled ³	2.50¢	2.50¢	2.50¢	2.50¢ ¹⁸	2.50¢		2.50¢					2.65¢ 2.93¢ 2.88¢
Cold-rolled ⁴	3.20¢	3.30¢		3.20¢			3.20¢			(Worcester=3.40¢)		3.35¢ 3.61¢ 3.58¢
Cooperage stock	2.80¢	2.80¢			2.80¢		2.80¢					3.09¢
TINPLATE												
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85		(Warren, Ohio=\$5.75)	\$6.15¢ \$6.06¢ ¹¹
Electro, box	(0.25 lb. 0.50 lb. 0.75 lb.)											
BLACKPLATE, 29 gage ⁵	3.60¢	3.60¢	3.60¢		3.70¢			3.78¢	3.70¢		(Warren, Ohio=\$5.75)	3.99¢ 3.90¢
BLACKPLATE, CANMAKING												
55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.												
TERNES, MFG., Special coated												
BARS												
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢				3.285¢	2.75¢ 3.01¢ 2.98¢
Rail steel ^{6, 19}	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢					
Reinforcing (billet) ⁷	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢			2.985¢	2.74¢ 2.65¢
Reinforcing (rail) ^{7, 16}	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢					
Cold-finished ⁸	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢			(Detroit=3.25¢)		3.61¢ 3.58¢
Alloy, hot-rolled	3.05¢	3.05¢					3.05¢	3.05¢		(Bethlehem, Massillon, Canton=3.05¢)	3.20¢	3.19¢
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢				3.95¢	
PLATE												
Carbon steel ¹²	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Coatesville, Claymont=2.80¢, Geneva, Utah=2.80¢)	3.46¢ ¹⁴	2.87¢ 2.85¢
Floor plates	3.90¢	3.90¢										4.30¢ 4.28¢
Alloy	3.79¢	3.79¢				(Coatesville=4.10¢)						4.01¢ 3.895¢
SHAPES, Structural	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			(Geneva, Utah=2.65¢) (Bethlehem=2.50¢)	3.17¢ ¹⁸		2.70¢ 2.64¢
SPRING STEEL, C-R												
0.26 to 0.40 carbon	3.20¢			3.20¢					(Worcester=3.40¢)			
0.41 to 0.60 carbon	4.70¢			4.70¢					(Worcester=4.90¢)			
0.61 to 0.80 carbon	5.30¢			5.30¢					(Worcester=5.50¢)			
0.81 to 1.00 carbon	6.80¢			6.80¢					(Worcester=7.00¢)			
Over 1.00 carbon	9.10¢			9.10¢					(Worcester=9.30¢)			
MANUFACTURERS' WIRE												
Bright ¹⁰	3.30¢	3.30¢	3.30¢	3.30¢					(Worcester=3.40¢, Duluth=3.35¢)	5.63¢ ¹³		3.71¢ 3.68¢
Galvanized									Add proper size extra and galvanizing extra to Bright Wire Base			
Spring (high carbon)	4.25¢	4.25¢	4.25¢						(Worcester=4.35¢, Duluth=4.50¢) (Trenton=4.50¢)	5.24¢ ¹³		4.06¢ 4.595¢
PILING, Steel sheet	3.00¢	3.00¢				3.00¢						3.41¢ 3.38¢

PRICES

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation		Subject to negotiation			
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt.	Subject to negotiation		Subject to negotiation			
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville.	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton.	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi.	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt.	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.	25.50	23.50	18.50	19.00	23.00	28.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown.	32.50	30.50	24.00	24.50	28.50	33.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila., Ft. Wayne.	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.	32.48	30.30	23.80	24.34	28.62	33.28
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.	27.05	25.97	20.02	20.56	24.34	29.75
Rod, h-r, Syracuse.	72.09	72.09	.....	68.49	.....	.....
Tubing, seamless, P'gh, Chi, Canton, (4 to 8 in.)	.....	.....	.....	.....	.....	.....

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)

W	Cr	V	Mo	Base per Pounds
18	4	1	—	74¢
1.5	4	1.5	8	59¢
6	4	2	6	63¢
High-carbon-chromium*				47¢
Oil hardening manganese*				26¢
Special carbon*				24¢
Extra carbon*				20¢
Regular carbon*				16¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.20¢
Armature	4.50¢
Electrical	5.00¢
Motor	5.70¢
Dynamo	6.45¢
Transformer 72	6.95¢
Transformer 65	7.65¢
Transformer 58	8.35¢
Transformer 52	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb.	\$2.50
Angle splice bars, 100 lb.	3.00
(F.o.b. basing points) per 100 lb	
Light rails (from billets)	\$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa.	2.95

Base per lb

Cut spikes	4.50¢
Screw spikes	6.40¢
Tie plate, steel	2.80¢
Tie plates, Pacific Coast	2.95¢
Track bolts	6.50¢
Track bolts, heat treated, to rail roads	6.75¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C....	\$6.75	\$13.50

CLAD STEEL

Base prices, cents per pound

	Plate Sheet
Stainless-clad	
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	\$4.00* 22.00
Nickel-clad	
10 pct, f.o.b. Coatesville, Pa.	21.50
Inconel-clad	
10 pct, f.o.b. Coatesville..	30.00
Monel-clad	
10 pct, f.o.b. Coatesville..	29.00
Aluminized steel	
Hot dip, 20 gage, f.o.b. Pittsburgh	9.00

*Includes annealing and pickling.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per San Francisco
Standard, galvanized and coated nails	\$3.75† \$4.83
Cut nails, carloads, Pittsburgh base	5.30

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb
Annealed fence wire	\$3.95† \$4.96
Annealed galv. fence wire	4.40† 5.41

†10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column
Woven wire fence*	84 107
Fence posts, carloads...	90††
Single loop bale ties	86 110
Galvanized barbed wire**	94 114
Twisted barless wire	94

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. †† Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldo-cor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otis-cloy	Yoloy	Y-50	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethle-hem	Jones & Laughlin	Youngs-town Sheet & Tube	Ameri-can Rolling Mill	Great Lakes Steel
Plates.....	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	....	4.10
Sheets										
Hot-rolled...	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled...	4.75	4.75	4.75	....	4.75	4.75	4.75	4.75	5.225*	4.55
Galvanized...	....	5.40	....	....	....	5.40	....	....	....	....
Strip										
Hot-rolled...	3.85	3.85	3.85	....	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled...	....	....	4.75	....	....	4.75	4.75	4.75	5.00*	4.55†
Shapes.....	....	3.85	....	....	3.85	3.85	3.85	3.85	....	....
Beams.....	....	3.85	....	....	....	3.85	....	....	....	....
Bars										
Hot-rolled...	4.00	4.00	4.00	....	....	4.00	4.00	4.00	....	4.00
Cold-rolled...	....	....	....	....	....	....	....	4.60	....	....
Bar shapes.....	....	4.00	....	....	4.00	4.00	4.00	4.00	....	....

* 21 gage and lighter. † Pittsburgh, add 0.10¢ at Chicago and Gary.

PRICES

PIPE AND TUBING

Base discounts. F.o.b. Pittsburgh and Lorain, steel butt-weld and seamless. Others f.o.b. Pittsburgh only

Base price, \$200.00 per net ton

Standard, threaded & coupled

Steel, butt-weld	Black	Galv.
3/4 in.	55 1/2	41
1 in.	58 1/2	45
1 to 3-in.	60 1/2	47 1/2
Wrought Iron, butt-weld		
3/4 in.	2	+20
1 in.	11 1/2	+10
1 and 1 1/4-in.	17	+2
1 1/2-in.	22 1/2	1 1/2
2-in.	23	2

Steel, lap-weld		
3-in.	53	39 1/2
2 1/2 and 3-in.	56	42 1/2
3 1/2 to 6-in.	58	44 1/2

Steel, seamless		
2-in.	52	38 1/2
2 1/2 and 3-in.	55	41 1/2
3 1/2 to 6-in.	57	43 1/2

Wrought Iron, lap-weld		
2-in.	14 1/2	+5 1/2
2 1/2 to 3 1/4-in.	17	+1 1/2
4-in.	21	4
4 1/2 to 8-in.	19	3 1/2

Extra Strong, plain ends

Steel, butt-weld		
3/4 in.	54 1/2	41 1/2
1 in.	58 1/2	45 1/2
1 to 3-in.	60	48

Wrought Iron, butt-weld		
3/4 in.	6 1/2	+14
1 in.	12 1/2	+8
1 to 2-in.	22	2

Steel, lap-weld		
2-in.	52	39 1/2
2 1/2 and 3-in.	56	43 1/2
3 1/2 to 6-in.	59 1/2	47

Steel, seamless		
2-in.	51	38 1/2
2 1/2 and 3-in.	55	42 1/2
3 1/2 to 6-in.	58 1/2	46

Wrought Iron, lap-weld		
2-in.	17 1/2	+3
2 1/2 to 4-in.	26	8 1/2
4 1/2 to 6-in.	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, butt-weld, lap-weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lap-weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap-weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt-weld. On butt-weld and lap-weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, out length 4 to 24 ft, inclusive.

O.D. Gage	Seamless	Electric Weld
In in. BWG	Hot-Cold	Hot-Cold
2	15.29	15.17
2 1/2	20.57	20.11
3	22.87	22.26
3 1/2	25.86	25.06
4	35.82	34.78

CAST IRON WATER PIPE

6-in. to 24-in. del'd Chicago	Per net ton
6-in. to 24-in. del'd New York	\$81.56
6-in. to 24-in., Birmingham	79.80
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	71.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	95.00

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

Percent Off List	
½ in. & smaller x 6 in. & shorter	55
Over 6 in.	45
9/16 & ¾ in. x 6 in. & shorter	52
9/16 through 1 in. x over 6 in.	48
¾ & 1 in. x in. and shorter	51
¾ in. x 6 in. & shorter	49
1½ in. and larger, all lengths	48
Lag, all diam over 6 in. long	43
Lag, all diam x 6 in. & shorter	50
Plow bolts	57

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/2 in. inclusive	45
1 in. and larger	44

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts U.S.S. S.A.E.

Base discount less case lots

7/16 in. and smaller	51
1/2 in. and smaller	48
1/2 in. through 1 in.	48
9/16 in. through 1 in.	47
1 1/2 in. through 1 1/2 in.	46
1 1/2 in. and larger	44

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Consumer

Packages, nuts separate	60 and 10
In bulk	74

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(1/2 in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$5.25
F.o.b. Lebanon, Pa.	5.40

Small Rivets

(7/16 in. and smaller)

Percent Off List	
F.o.b. Pittsburgh, Cleveland, Chicago,	
Birmingham	55 and 5

Cap and Set Screws

Percent Off List

(In packages)	Consumer
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56

1/2 to 1 in. x 6 in., SAE 1035, heat treated	47
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF ₂ Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, non-bessemer	5.80
Mesabi, bessemer	5.70
Mesabi, non-bessemer	5.55
High phosphorus	5.55
Prices quoted retroactive to Jan. 1, 1947.	

METAL POWDERS

Prices in cents per pound in ton lots f.o.b. shipping point.

Brass, minus 100 mesh	23¢ to 27¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Swedish sponge iron, 100 mesh, c.l.f.	
N. Y., carlots, ocean bags	7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	66¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.025
Lead, 100, 200 & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	33¢
Nickel, 150 mesh	51 1/2¢
Silicon, 100 mesh	18.15¢
Solder powder, 100 mesh	8 1/2¢ plus metal
Tin, 100 mesh	86.75¢
Tungsten metal powder, 98%+ 99%, any quantity, per lb.	\$2.80
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$10.00 to \$11.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	11.00 to 12.00

Foundry, Byproduct

Chicago, del'd	\$16.10
Chicago, f.o.b.	15.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, del'd	15.46
Buffalo, del'd	16.14
Ashland, Ohio, f.o.b.	13.35
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	15.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	13.25

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carloads, Per 100¢

First quality, Ohio	\$64.00
First quality, Pa., Md., Ky., Mo.	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo.	64.00
Sec. quality, New Jersey	59.00
Sec. quality, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

Silica Brick

Pennsylvania and Birmingham	\$70.00
Chicago District	79.00
Silica cement, net ton (Eastern)	12.00
Chicago	13.50

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Plymouth Meeting, Chester	\$59.00
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Magnesite Brick

Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, O.	10.55
Midwest, add 10¢; Mo. Valley, add 20¢	

PRICES

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		Plates	Standard Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled (10 gage)	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	1 Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	\$4.24	\$5.18	\$5.29	\$4.43	\$5.28	\$4.54	\$4.22	\$4.48	\$5.38	\$8.37	\$8.37	\$9.88	\$9.88
New York	4.42	5.17 ¹	5.47	4.62	5.40	4.72	4.37	4.62	5.42	8.42	8.42	9.92	9.92
Boston	4.50	5.12 ^{1,2}	5.55 ^{1,2}	4.65	6.35 ⁶	4.80	4.47	4.62	5.46 ⁸	8.62	8.62	9.97	9.97
Baltimore	4.09	....	5.14	4.40	....	4.39	4.34	4.45	5.35	....	....	....	....
Norfolk	4.35	....	....	....	....	4.50	4.50	4.75	5.50	....	....	....	....
Chicago	3.65	....	....	4.05	5.05	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee	4.199	4.799	5.249	4.199	....	4.499	4.249	4.249	5.149	8.399	8.399	9.649	9.649
Cleveland	4.00	4.60	5.238	4.188	4.85	4.30 [†]	4.311	4.05	4.95	8.358	8.358	9.35	9.35
Buffalo	4.00	4.60	5.35	4.30	5.25	4.65	4.05	4.05	4.95	8.10	8.10	9.35	9.35
Detroit	4.15	4.75	5.42	4.34	5.24	4.59 [†]	4.42	4.20	5.12	8.51	8.51	9.74	9.74
Cincinnati	4.116	4.716	5.166	....	....	4.803	4.444	4.403	5.303	....	....	....	....
St. Louis	4.199	4.799	5.424	4.199	5.424	4.499	4.249	4.249	5.324	8.574	8.574	9.824	9.824
Pittsburgh	4.00	4.60 [†]	5.05	4.00	4.85	4.30	4.05	4.05	4.95	8.10	8.10	9.35	9.35
St. Paul	4.384 ⁷	5.034 ¹	5.434 ²	4.404 ⁷	....	4.684 ⁷	4.434 ⁷	4.434 ⁷	5.728 ⁸	....	10.084 ⁴	....	11.728 ⁸
Duluth	....	....	....	....	....	....	....	....	....	....	....	....	....
Omaha	4.868	6.618 ¹	5.918	4.868	....	5.168	4.918	4.918	5.818	....	....	....	....
Indianapolis	....	....	....	....	....	....	....	....	....	....	....	....	....
Birmingham	3.85 ¹¹	....	5.20	4.00 ¹¹	....	4.30 ¹¹	4.05 ¹¹	4.05 ¹¹	5.83	....	....	....	....
Memphis	4.47	....	5.97	4.72	....	4.92	4.67	4.67	5.78	....	....	....	....
New Orleans	*4.46 ¹¹	5.77 ¹	....	....	....	4.83 ¹¹	*4.68 ¹¹	*4.78 ¹¹	6.14	....	....	....	....
Los Angeles	5.35	7.00 ¹	6.70	5.65	8.35 ⁵	5.20 ¹²	5.10 ¹³	5.10 ¹³	6.90 ¹⁴	9.65 ¹⁰	9.35	11.05	11.05
San Francisco	4.90 ⁸	6.30 ⁹	6.45	5.20 ⁸	....	5.00 ⁸	4.90 ⁸	4.75 ⁸	7.00 ¹⁰	....	....	....	....
Seattle	5.00	7.80	6.30	5.30 ⁴	....	5.25 ⁴	4.95 ⁴	5.00 ⁴	7.10	....	....	....	....
Portland	5.00 ³	....	6.25 ⁹	5.50 ³	....	5.40 ³	5.10 ³	5.10 ³	7.20	....	9.30 ⁷	....	....
Salt Lake City	6.25	....	7.71	6.50	....	6.10	6.25	6.25	7.50 ¹⁰	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 lb and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 10,000 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 8749; (13) 400 to 1999; (14) 1500 and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	34.00	34.50	35.00	35.50		Boston	Everett	\$0.50 Arb.	29.50	30.00	30.50	31.00	
Birdboro	34.00	34.50	35.00	35.50	39.00	Boston	Birdboro-Steelton	4.82					43.82
Birmingham	29.38	29.88				Brooklyn	Bethlehem	3.00	37.00	37.50	38.00	38.50	
Buffalo	32.50	33.00	33.50			Brooklyn	Birdboro	3.50					42.50
Chicago	32.50	33.00	33.50	34.00		Cincinnati	Birmingham	4.87	34.25	34.75			
Cleveland	32.50	33.00	33.50			Jersey City	Bethlehem	1.84	35.84	36.34	36.84	37.34	
Duluth	33.00	33.50	34.00	34.50		Jersey City	Birdboro	2.33					41.33
Erie	32.50	33.00	33.50	34.00		Los Angeles	Provo	5.94	38.94	39.44			
Everett	29.00	29.50	30.00	30.50		Mansfield	Cleveland-Toledo	2.33	34.83	35.33	35.83	36.33	
Granite City	32.50	33.00	33.50			Philadelphia	Swedeland	1.01	36.01	36.51	37.01	37.51	
Neville Island	33.00	33.50	33.50	34.00		Philadelphia	Birdboro	1.49					40.49
Provo	33.00	33.50				San Francisco	Provo	5.94	38.94	39.44			
Sharpsville	33.00	33.50	33.50	34.00		Seattle	Provo	5.94	38.94	39.44			
Steelton	34.00				39.00	St. Louis	Granite City	0.75 Arb.	33.25	34.25	34.25		
Struthers, Ohio	33.50												
Swedeland	37.50	35.50	36.00	36.50									
Toledo	32.50	33.00	33.50	34.00									
Troy, N. Y.	34.00	34.50	35.00	35.50	39.00								
Youngstown	32.50	33.00	33.00	33.50									

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$40.50; f.o.b. Buffalo—\$41.75. Add \$1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct.

Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$40.50 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$45.99. High phosphorous charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.
 Carload lots (bulk) \$135.00
 Less ton lots (packed) 143.50
 F.o.b. Pittsburgh 139.50
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.
 Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.
 Eastern Central Western
 Carload, bulk .. 6.40 6.65 7.20
 Ton lots 7.30 7.90 9.80
 Less ton lots .. 7.70 8.30 10.20

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.
 16-19% Mn 19-21% Mn
 3% max. Si 3% max. Si
 Carloads \$43.00 \$44.00
 F.o.b. Pittsburgh 47.00 48.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
 Carload, bulk 30
 L.c.l. lots 33

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
 Carloads 32
 Ton lots 34
 Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.
 Carloads Ton Less
 0.10% max. C, 0.06% P, 90% Mn 21.00 21.40 21.65
 0.10% max. C 20.50 20.90 21.15
 0.15% max. C 20.00 20.40 20.65
 0.30% max. C 19.50 19.90 20.15
 0.50% max. C 19.00 19.40 19.65
 0.75% max. C 18.50 18.90 19.15
 7.00% max. Si 16.00 16.40 16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.
 Carload, bulk 6.45
 Ton lots 7.40
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet 6.15
 Ton lots 7.05
 Less ton lots 7.45

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$56.00 f.o.b. Keokuk, Iowa; \$52.75 f.o.b. Jackson, Ohio; \$54.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.
 Eastern Central Western
 96% Si, 2% Fe.. 14.65 16.90 18.65
 97% Si, 1% Fe.. 15.05 17.30 19.05

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb briquets.
 Eastern Central Western
 Carload, bulk .. 3.85 4.10 4.30
 Ton lots 4.75 5.35 5.65
 Less ton lots .. 5.15 5.75 6.05

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 25% Si 11.65 7.95 8.15
 50% Si 7.45 7.95 8.15
 75% Si 9.25 9.55 10.30
 80-90% Si 10.45 10.75 11.50
 90-95% Si 12.05 12.35 13.05

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 0.06% C 23.00 23.40 24.00
 0.10% C 22.50 22.90 23.50
 0.15% C 22.00 22.40 23.00
 0.20% C 21.50 21.90 22.50
 0.50% C 21.00 21.40 22.00
 1.00% C 20.50 20.90 21.50
 2.00% C 19.50 19.90 20.50
 65-69% Cr, 4-9% C 15.60 16.00 16.15
 62-66% Cr, 4-6% C 16.60 17.00 17.15
 Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.
 Eastern Central Western
 Carload, bulk .. 9.85 10.10 10.20
 Ton lots 10.75 11.65 12.25
 Less ton lots .. 11.15 12.05 12.65

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Eastern Central Western
 Carload 16.70 17.10 17.25
 Ton lots 17.90 19.20 20.00
 Less ton lots .. 18.60 19.90 20.70
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
 Eastern Central Western
 Carload 20.00 20.40 21.00
 Ton lots 21.00 21.65 22.85
 Less ton lots .. 22.00 22.65 23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.
 Eastern Central Western
 0.20% max. C .. 83.50 85.00 86.25
 0.50% max. C .. 79.50 81.00 82.25
 9.00% min. C .. 79.50 81.00 82.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60.65% Si, 6.00% max. Fe.
 Eastern Central Western
 Carloads 13.00 13.50 15.55
 Ton lots 14.50 15.25 17.40
 Less ton lots .. 15.50 16.25 18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 16-20% Ca, 14-18% Mn, 53-59% Si.
 Eastern Central Western
 Carloads 15.50 16.00 18.05
 Ton lots 16.50 17.35 19.10
 Less ton lots .. 17.00 17.85 19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.
 Cast Turnings Distilled
 Ton lots \$1.60 \$2.35 \$2.95
 Less ton lots .. 1.95 2.70 3.75

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
 Eastern Central Western
 Ton lots 13.50 14.60 16.55
 Less ton lots .. 14.25 15.35 17.30
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
 Eastern Central Western
 Ton lots 13.25 14.35 16.30
 Less ton lots .. 14.00 15.10 17.05

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.
 Eastern Central Western
 Ton lots 13.25 14.35 16.30
 Less ton lots .. 14.00 15.10 17.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed... \$2.00
 Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.
 Openhearth \$2.70
 Crucible \$2.80
 High speed steel (Primos)... \$2.90
 Vanadium pentoxide, 88-92% V₂O₅ technical grade, contract basis, per pound contained V₂O₅ \$1.10
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb \$2.50
 Ton lots \$2.55
 Less ton lots
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 95¢
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 80¢
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo 80¢
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo 80¢
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti \$1.23
 Less ton lots \$1.25
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti \$1.35
 Less ton lots \$1.40
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton... \$142.50
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload, lots 14.50¢
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy 4.85¢
 Carload, bulk
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload 6.25¢
 Ton lots 6.75¢
 Simanal, 20% Si, 20% Mn, 30% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots 9.00¢
 Ton lots 9.75¢
Boron Agents
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
 Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.
 Eastern Central Western
 Less ton lots .. \$1.30 \$1.3075 \$1.329
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.
 Ton lots \$1.89 \$1.903 \$1.935
 Less ton lots 2.01 2.023 2.055
 Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.
 Less ton lots.. \$2.10 \$2.1125 \$2.1445
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
 Carload lots 35¢
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
 No. 1 87.5¢
 No. 6 60¢
 No. 79 45¢
 Bortram, f.o.b. Niagara Falls
 Ton lots, per pound 45¢
 Less ton lots, per pound..... 50¢
 Carbortam, f.o.b. Suspension Bridge, N.Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.
 Ton lots, per pound 8.0¢

Annual Corrosion Conference Featured 36 Technical Papers

Chicago

• • • Thirty-six technical papers and eight symposiums were featured at the third annual National Assn. of Corrosion Engineers all-corrosion conference and exhibition which was held Apr. 7 through 10 at the Palmer House in Chicago. For the first time the entire proceedings of the association, together with the exhibition, which totaled 54 booths, were held under one roof.

In the course of the well-filled 4-day program the latest developments in the field of corrosion research and control were covered. Under the direction of Tom L. Holcombe, chairman of the general committee, and R. B. Mears, technical program chairman, the conference and exhibition proved stimulating and well worth the trip to the many engineers and executives that were in attendance both from here and abroad. With the country's foremost technicians, both practical and research men, full-scale attacks were launched at industrial corrosion problems. The theme, "defeat corrosion," was well planned and carried out during the presentation of the technical papers.

Among the speakers who presented papers during the first technical sessions, the water industry symposium, were G. P. Loschiavo and J. M. Bialosky. Mr. Loschiavo's paper, "Treatment of Water in Army Supplies in New England," was a summary of the practical and theoretical experience gleaned during the war years when he was assigned to handle scale and corrosion studies in that area. Mr. Loschiavo is at present a chemical engineer with headquarters at the strategic air command, Washington, D. C., in charge of boiler treatment.

Mr. Bialosky, an associate metallurgist at Armour Research Foundation, Chicago, presented "Cathodic Protection of Hot Water Tanks," which attracted widespread interest. His paper developed the mechanism of polarization which occurs in freely corroding galvanic couples with a complete description of the cathodic polarization resulting from

Meeting Covered Development In the Field of Corrosion Research and Control

• • •

the application of an external anode. The variability of water analyses and the factors which influence corrosion in hot water and their effects on the application of cathodic protection were fully discussed.

During the chemical industry symposium two of the four interesting papers presented drew considerable interest. "Prevention of Ferric Ion Corrosion During Acid Cleaning," prepared by F. N. Alquist, J. L. Wasco and H. A. Robinson, was very well received. "Plastics for Corrosion Control," presented by Dr. J. W. Shackleton, revealed some interesting characteristics of these materials. Dr. Shackleton, who is active in the technical service department of E. I. duPont de Nemours & Co., Inc., Arlington, N. J., revealed a wide experience and a diversified background in the plastics field.

F. J. Albano's presentation of a comprehensive paper on "Electro-chemical Factors in Underground Corrosion of Lead Cable Sheath" delved into the forms of

lead cable corrosion which are attributable to the action of stray currents, and discussed the more common chemical or physical inhomogeneities in the metals. He also covered the environment which set up minute galvanic cells, the operation of which cause electrical currents responsible for some types of corrosion. This speaker also considered the chemical constituents in the soil or in the underground cable plant in terms of their effects on the electro-chemical behavior of the corrosive cells.

"The Effects of Atmospheric Corrosion on the Economics and Maintenance of Guy Strand and Line Hardware" was very completely covered during the electrical industry session by J. C. Couy, division engineer in the distribution department of the Duquesne Light Co., Philadelphia. Another interesting presentation was given by Dr. C. Kenneth Eilerts, senior physical chemist, and Faye O. Greene, of the Petroleum Experimental Station, Bureau of Mines, Bartlesville, Okla., on "Alloying Steels for Corrosion Resistance to Gas Condensed Fluid," which was given during the gas industry symposium.

Dr. R. M. Buffington's paper.
(CONTINUED ON PAGE 128)

ROBBING PETER
TO PAY PAUL:
"Spare-Aire," the
Chevrolet accessory
shown here is de-
signed to pilfer air
from the spare tire
to inflate a punc-
tured or slowly
leaking tire to elim-
inate tire changing
when within a rea-
sonable distance of
a service station.
Chevrolet figures 90
pct of all flat tires
have slow leaks so
that an emergency
inflation will suf-
fice, eliminating
most roadside tire
changes. The acces-
sory will pipe half
the air from the
spare and a few
pounds from each of
the other tires, if
necessary.

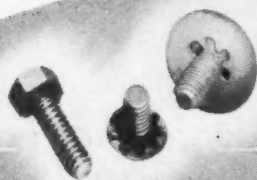


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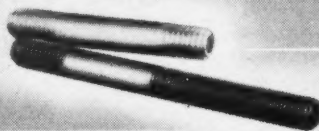
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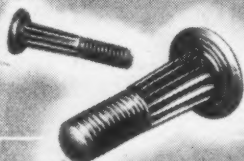
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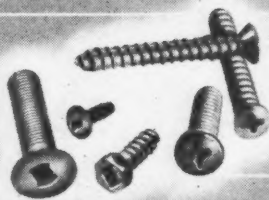
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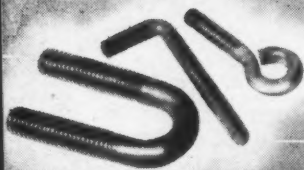
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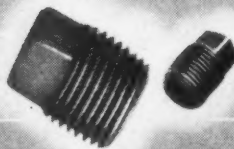
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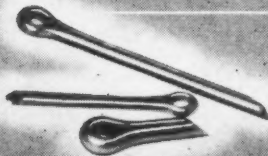
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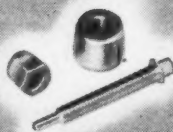
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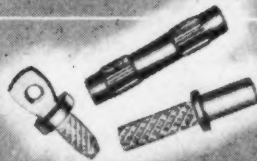
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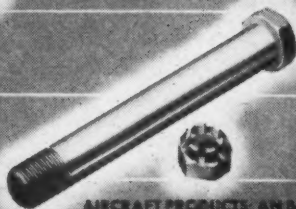
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There's an Important POINT TO THIS STORY!



An important question to ask yourself in buying cotters is this: are they engineered to give maximum speed and efficiency in assembly operations—to eliminate time-wasting, money-wasting and fumbling?

Illustrated above are the seven basic point designs of Lamson & Sessions cotter line. Each one has been developed and tested to perform a specific job faster and more efficiently than ordinary "run of the mill" cotters.

The popular "Efficiency" point* design of Lamson cotters gives them a "drift pin" action that helps align parts for easy insertion. And since one shank is longer than the other, it's an easy matter to spread them apart.

Lamson cotters are available in sizes from $\frac{1}{32}$ " x $\frac{1}{4}$ " to $\frac{3}{4}$ " x 24" and may be obtained in production

quantities in a variety of metals and alloys—steel, brass, bronze, stainless steel and aluminum alloy.

Consider *your* use for cotters and decide from the illustration which point best satisfies your requirements. Or better still, write us, giving details of your cotter applications and we'll gladly recommend the best point for your particular needs.

You can get quick delivery on most types of Lamson cotters from your mill supplies distributor.

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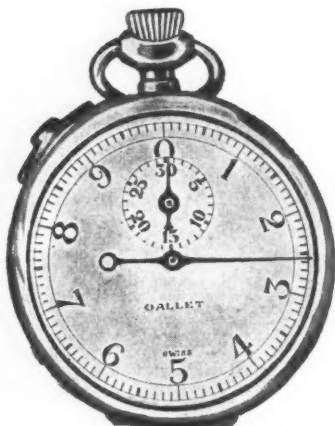
MILLED
BOLTS • SH
LTS • BRAS
NUTS and SCREWS • S
THUMB SCREWS • FIN HEAD BOLTS •

(CONTINUED FROM PAGE 125)

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For Industry,
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GALLET DECIMAL TIMER

This dependable instrument divides the minute into 100 parts. Side slide for time out. Small hand registers revolution of long hand. Fly back from crown. Nickel case; lever movement. 7 jewels. Non-magnetic. GALLET—No. 301

Our technicians will gladly advise as to the best timer or chronograph available for any particular industrial purpose or for a specific sport or scientific use. You may inquire for this counsel without obligation or write for our catalog.

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M. J. STILLMAN CO. INC.
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"Thermogalvanic Corrosion," was a continuation of a paper presented by Dr. N. E. Berry at the Kansas City meeting of NACE and explained the basic principles from a thermodynamic viewpoint. Dr. Buffington, in abstracting his paper, wrote: "It is shown by simple tests that irreversible processes which occur in a temperature gradient have no effect on the equilibrium potentials of two thermogalvanic cells, and it's predicted that this will prove to be quite generally true. This statement emphasizes the importance of thermogalvanic measurements in a study of thermodynamics of electrolytic solutions, and has immediate application in the calculation of thermogalvanic potentials from entropy data.

"It is possible to quantitatively identify the entropy change calculated from thermogalvanic data by means of the Gibbs-Helmholtz equation, with the entropy change of the electrode reaction. Theoretical values of thermogalvanic potentials are calculated approximately for the number of cells. It is shown that the dilution increases the tendency for metals to migrate from the hot to the cold electrodes, thus either increasing or decreasing the potential according to its size. Factors which affect thermogalvanic corrosion rate were considered and general conclusions drawn concerning the conditions which determined whether thermogalvanic corrosion can or cannot be important."

In the oil industry symposium held on Wednesday, R. W. Manuel, Phillips Petroleum Co., Bartlesville, Okla., presented a

highly controversial paper on the effects of carbide structure on the corrosion resistance of steel. Mr. Manuel investigated the state of carbides and their effect on corrosion rates. Mr. Manuel discovered that in ordinary steels the least corrosive effects were had with a structure composed of a fine pearlitic distribution of the carbides.

During the conference two eminent research authorities, Dr. Willis R. Whitney and Dr. Frank N. Speller, were named first recipients of the newly established award of the National Assn. of Corrosion Engineers for their outstanding contribution to the science of corrosion and corrosion engineering. The presentations were made at the banquet of the association's annual conference on Wednesday evening.

F. J. McElhatton, president of the association, announced that the awards will be known as the Willis Rodney Whitney Awards in the science of corrosion and the Frank Newman Speller Award in corrosion engineering, named in honor of their first recipients. These awards will continue to be made annually in recognition of outstanding contributions pertaining to the field of corrosion.

Dr. Whitney was signally honored for his fundamental work in the field of corrosion through his establishment of the electrochemical theory in corrosion. In his absence, Dr. Herbert H. Hulig, a former associate who has charge of the corrosion laboratory at the Massachusetts Institute of Technology, received the award for him. Dr. Speller's award was for

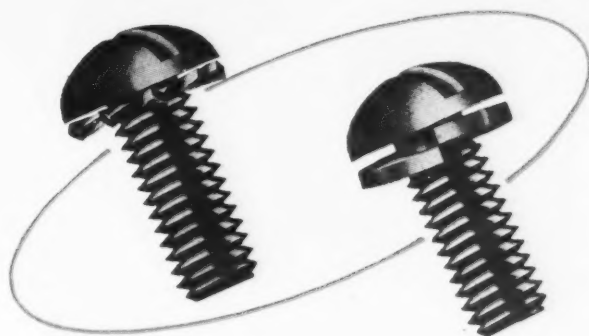
NO BABY: The new Austin "110" Sheerline sedan, which marks this British manufacturer's re-entry into the 6-cylinder market. It has a 117-in. wheelbase, develops 110 hp, and has four built-in power operated hydraulic wheel jacks. Cost in England, including purchase tax, is approximately \$5112.



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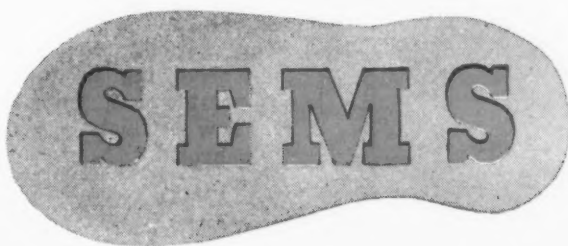


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the *MODERN*
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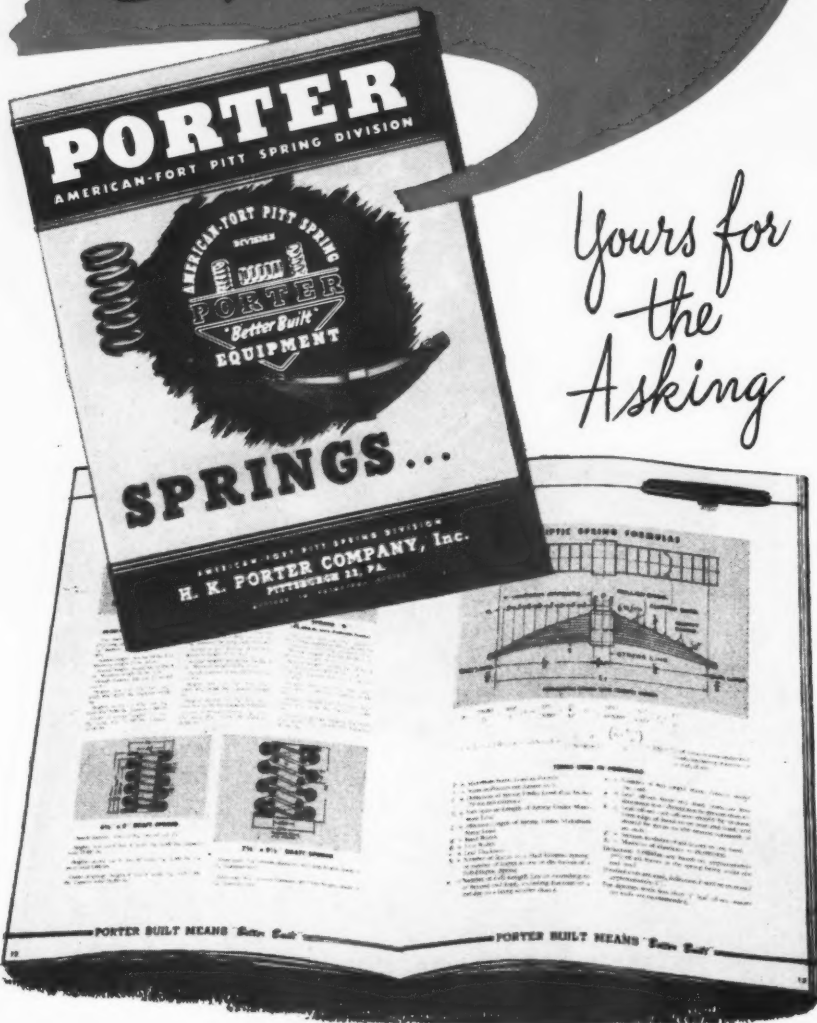
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NEWS OF INDUSTRY

his application of fundamental studies to practical engineering problems. Dr. Speller is world famous for his extensive corrosion investigations. His book, "Corrosion—Causes and Prevention," is now being rewritten for the third edition and is well known to all workers in corrosion.

Although Dr. Whitney has done a great deal of practical and theoretical scientific research work and has received numerous scientific medals and awards, and honorary degrees, his notable achievement has been the creation and development of the General Electric Co. research laboratory.

Dr. Speller began his work in the industry in the chemical laboratory of the Carnegie-Illinois Steel Corp. at Homestead, and in 1904 he was made metallurgical engineer of the National Tube Co., in which capacity he served until 1926. He was promoted to director of the metallurgical and research department of the National Tube Co., a position which he held until 1940 when he went into private consulting work.

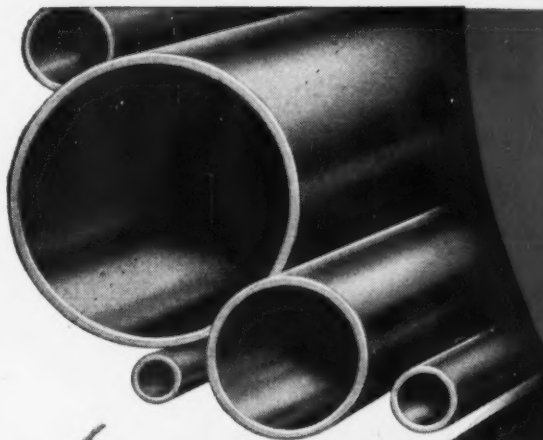
Use Cuban Chrome Ore In New Air-Emplaced Openhearth Refractory

Cleveland

... A new air-emplaced refractory utilizing Cuban chrome ore as a base, designed to facilitate the maintenance and repair of acid or basic brick openhearth furnace interiors, has been developed by Basic Refractories, Inc., according to Samuel Eells, vice-president in charge of sales. The new product, to be known as "Gunchrome."

Development of a new B. R. I. gun, which is equipped to wet the refractory shortly before the point of discharge and which has a discharge capacity of over 100 lb per min., was simultaneously announced by the company. The gun can be brought up close to the furnace whenever inspection shows brickwork to be in need of repair, it was said.

The first shipment of Cuban ore received recently consisted of 50 carloads which were unloaded at its Maple Grove, Ohio, plant where the air-emplaced and other maintenance refractories are processed.



✓ ROUND

1/4" to 4" O.D.
9 to 22 gauge



✓ SQUARE

1/2" to 2" 20 gauge
1" to 2 3/4" 14, 16, 18 gauge

Because it re-forms and machines so well, Michigan Welded Steel Tubing is widely used in the fabrication of production parts such as automobile exhaust and muffler tail pipes, gas tank filler tubes, steering jackets, and wherever bent and shaped tubes may be required. True concentricity, uniform I.D. and O.D. make it particularly economical when long runs are involved.

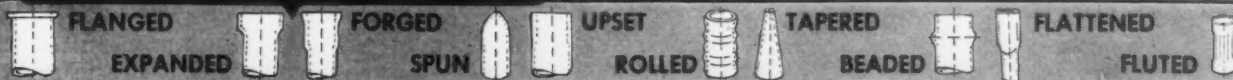
*The Modern Electric
Resistance Welded
Steel Tube*



✓ RECTANGULAR

1/2" to 2" 20 gauge
1" to 2 3/4" 14, 16, 18 gauge

Michigan welded tubing can be:



Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

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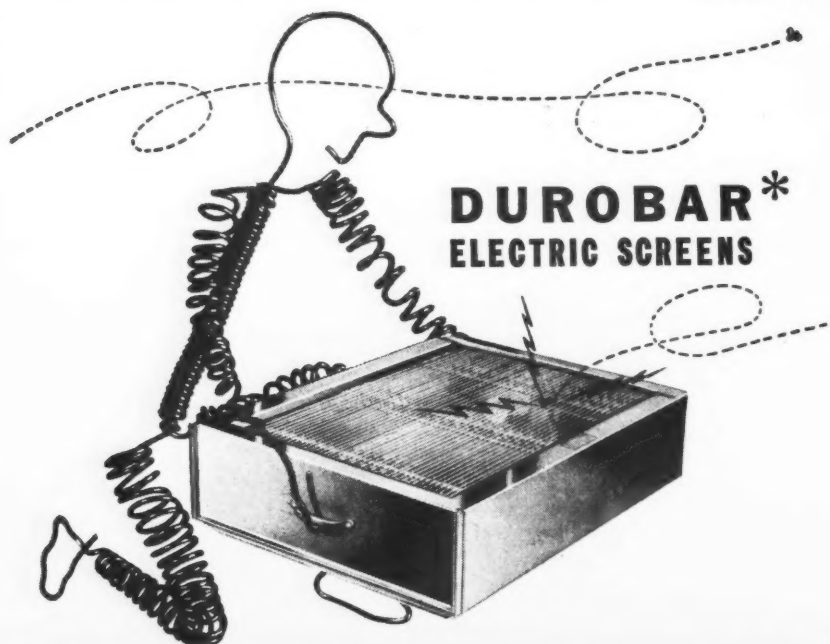
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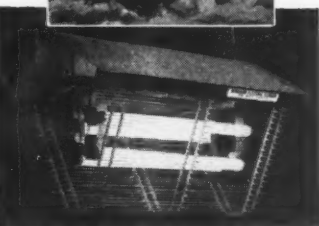
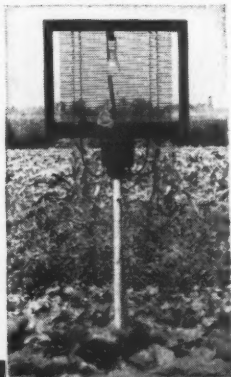
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ELECTRIC SCREENS

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KEYSTONE WIRE

Other DUROBAR Electric Screens



(Above) For truck gardens and orchards.

(Below) Special model designed for Purdue University, used on corn borer control tests.

A deadly exterminator of flies and insects — in models for use in truck gardens and orchards, on screen doors and windows, and all inside locations. A built-in light draws the flies and insects . . . the electrified screen puts them away.

Many Durobar Electric Screens are used in barns and food processing plants where the air is charged with dilute acids and alkalies — very corrosive to ordinary steel wire. But special "Galvannealed" Keystone wire resists corrosion — valuable for Durobar Electric Screens and other applications where corrosion is a factor.

Whatever the wire need, Keystone can normally supply it.

* National Electric Screen Corporation,
Chicago 6, Illinois

SPECIAL ANALYSIS WIRE
for all industrial purposes



KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

NEWS OF INDUSTRY

Weekly Gallup Polls

(CONTINUED FROM PAGE 103)

pleted, finds that an even larger proportion of voters feel this to be the proper course. In short, there can be little doubt that the Vandenberg amendment is endorsed in principle by the majority of the country.

"Do you think the problem of aid to Greece and Turkey should be turned over to the United Nations organization?"

	Mar. 28 Pct	Today Pct
Yes	56	63
No	25	23
No opinion	19	14

Under the Vandenberg plan, the United States would keep its initiative in Greece while at the same time giving the United Nations the right to call a halt if the members so decided.


The great loyalty of the American people to the United Nations, which has been demonstrated by the discussion of recent weeks, is not surprising in the light of the recent past.

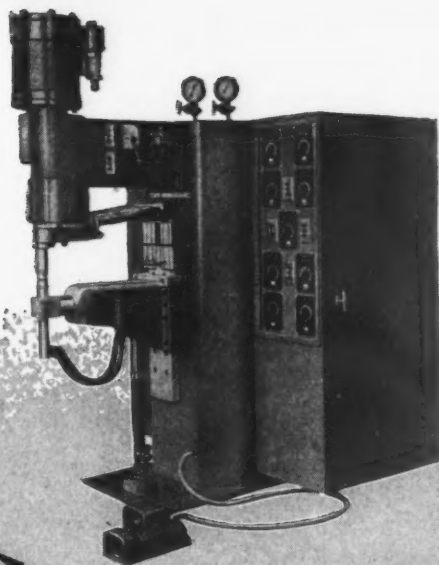
The idea of having an international organization to handle squabbles between nations was strongly approved by the American people as far back as the earliest days of World War II. Consistently, in every poll taken by the institute, overwhelming majorities backed the idea of a United Nations organization.

After the UN had begun to function, the American people were by no means satisfied with the progress it was making. As recently as January 1947 polls found 39 pct satisfied with the progress of the UN up to that time, 33 dissatisfied and 28 without opinions.

But this did not mean that the public had any desire to see the UN abandoned. Other surveys found the country just as strong as ever in its belief that peace for the United States lies in cooperating with other nations, rather than in returning to the isolationism that characterized the 1920s and early 1930s.

It is mainly because of that belief that the country today is so anxious to avoid bypassing the UN in the aid to Greece program.

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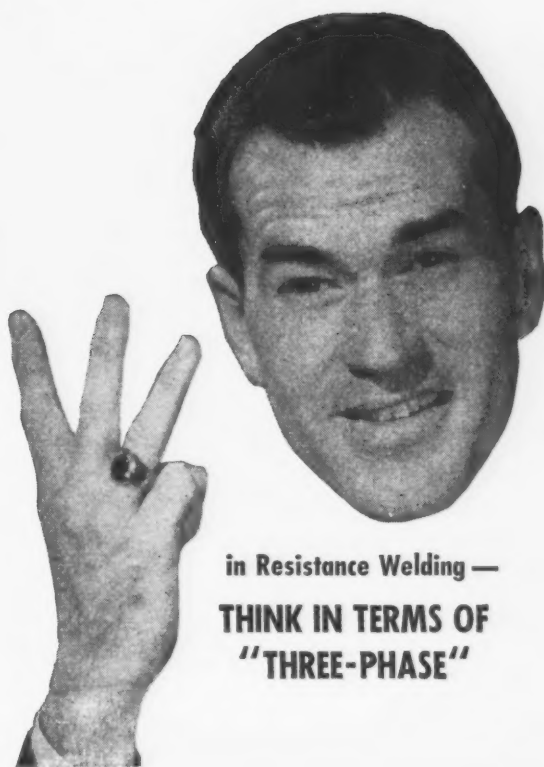
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**THINK IN TERMS OF
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BAKER TRUCK

multiplies manpower by
10!

A Philadelphia coffee roasting company uses a Baker Fork Truck for handling bagged coffee in five separate operations—reducing tasks formerly requiring hours of hard, physical effort, to minutes of safe, light work. Besides achieving substantial man-hour savings, the truck more than doubles warehouse capacity by tiering palletized loads two and three high.



● Coffee is received in highway trucks, in bags (not palletized) weighing 150 to 200 pounds. Three men, working a full day formerly unloaded approximately 750 bags and piled them

in the warehouse. Today, one operator with the Baker Truck, could easily unload 2500 bags. The truck first lifts the empty pallets onto highway truck from floor level. After bags are placed on pallets, the fork truck unloads and tiers the palletized units in the nearby warehouse area.

Since only a fraction of the truck's time is required for unloading and tiering, it is free to transport pallet loads of green coffee, in correct proportions for the desired blend, and spot them alongside the roasting station. This operation formerly took the *full time* of one man. Roasting completed, coffee is weighed off in 80 lb. bags and again palletized, so that the truck can move them either to temporary storage or load them directly into vehicles for shipment.

Whether your problem is handling bags, cartons, drums, bulky parts or practically any other material, the fork truck—pallet combination can save you money. Let the Baker Material Handling Engineer show you how.

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Baker INDUSTRIAL TRUCKS

NEWS OF INDUSTRY

The London Economist

(CONTINUED FROM PAGE 107)

which official propaganda has therefore been most ready to give the greatest possible publicity.

AND now has come the other *force majeure*—the conspiracy of the Western Powers against Russia's reconstruction. It is in this light that the Russian public is shown and sees the debates of the Foreign Ministers. From the Russian domestic angle, it has probably been a master stroke on Molotov's part—a master stroke in which he was greatly assisted by the other Ministers—to be able to demonstrate to the Russian public that the real deadlock between the allies has arisen over the issue of reparations.

A serious controversy over, say, Germany's future constitution would leave the Russian public lukewarm, if not altogether cold. Trouble between Russia and the western allies over federalism or centralism would most probably have provoked resentment inside Russia—resentment, that is, against the Soviet Government for spoiling the chances of agreement and cooperation with the West by obstinacy over irrelevant matters of constitutional doctrine.

But Molotov is sure to be sincerely applauded by every Russian whenever he comes to blows with Mr. Bevin and Mr. Marshall over the Russian claim for reparations. The concessions that he has made in the debate, his agreement to raise German steel output to 10 to 12 million tons a year and to extend the term for the payment of reparations to 20 years, have only strengthened his case. The arguments of the Western Ministers have, on the whole, been fairly and extensively reported in the Russian press and radio, but they can carry no conviction with the Russian public.

The British and the American taxpayers whom Bevin and Marshall have brought to the front, and on whose behalf they have refuted the Russian demands, cut no attractive characters in Russian eyes. Compared with the astronomical figures of Russia's war losses, the burden that the British and American taxpayers have to carry in order to feed Germany appears to the Russians even lighter than that proverbial straw that might



I look for all 8 to get **t.f.e.**

True
Fastener
Economy

It is the many costs of using a fastener that count . . . not just the initial price. True Fastener Economy is the lowest total cost for fastener selection, purchase, assembly and performance.

YOU GET **t.f.e.** WHEN YOU . . .

1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners
2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
4. Reduce the number and size of fasteners by proper design
5. Purchase maximum holding power per dollar
6. Simplify inventories by standardizing on fewer types and sizes of fasteners
7. Save purchasing time by buying larger quantities from one supplier's complete line
8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

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the things that make America strong*

Plants at Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also—the industry's most complete, easiest-to-use catalog.





Get TOP PROTECTION
at bottom cost!

20% STAINLESS
80% MILD STEEL

WHENEVER your plans include stainless steel protection for your products or plant equipment, look to **INGACLAD** Stainless-Clad Steel for top protection at bottom cost.

INGACLAD, with its 20% cladding of solid stainless steel, gives you 100% protection on the exposed or contact side.

INGACLAD costs much less than solid stainless.

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break the camel's back, especially the back of the American camel.

And why—this is the unsophisticated Russian query—should the feeding of Germany be a higher priority than the feeding of Russia? Molotov's disclosure of the secret Yalta protocol on reparations must have given an additional and powerful flip to popular Russian indignation — “is this how the Anglo-Saxon gentlemen honor their bonds, not merely words?”

It has often been said that Russian diplomacy has squandered the goodwill that Russia had accumulated in the western countries during the war. This is all too true. It is perhaps as well to realize that something similar is now happening the other way round. Whatever the merits or demerits of the British and American attitude over reparations, Bevin and Marshall have now certainly been squandering the enormous moral credit that the western democracies had acquired with the Russian people in recent years, a moral credit that until quite recently was still greater than has ever been realized in the west, and certainly great enough to cause serious embarrassment to the Soviet Government and to outlast most ups and downs of postwar diplomacy.

It might be said that in refusing so categorically reparations to the Russian people, the western statesmen have paid enormous moral reparations to their rulers. Uncooperative isolationism, which until recently was rather unpopular in Russia itself, is now almost certain to get powerful popular backing. In this mood, even such an outrageous and bizarre act of truly Oriental isolationism as the recent ban on marriages between Russian and foreign nationals, may be accepted by Russian opinion as a justifiable expression of the national bad temper against the outside world.

Arthur McKee Net Up

Cleveland

• • • Arthur G. McKee & Co. has reported net income for 1946 of \$403,828, compared with \$310,846 for 1945. H. E. Widdell, president, said that at the end of 1946 the company had a volume of work in process approximating \$50 million. This includes work in ten foreign countries, it was said.



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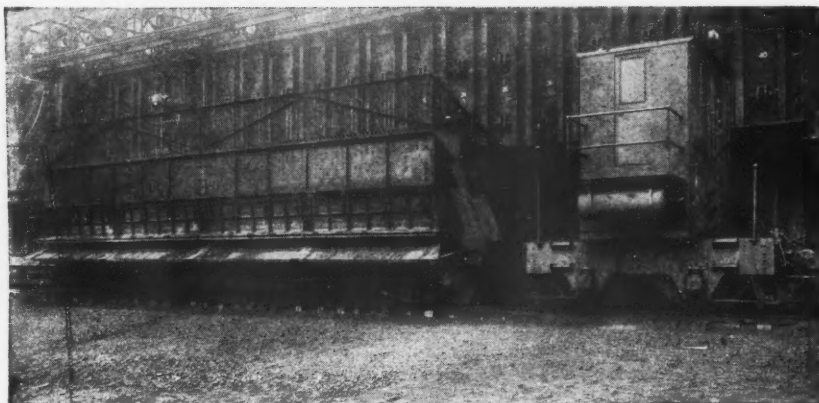
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Manufacturing License From National Malleable Given Australian Firm

Cleveland

• • • As part of a \$300 million program to modernize the Australian railway system, National Malleable & Steel Castings Co., Cleveland, has licensed Industrial Steels, Ltd., Sydney, to manufacture in Australia the Cleveland company's patented car couplers, freight car trucks, draft gears and other railway specialties.

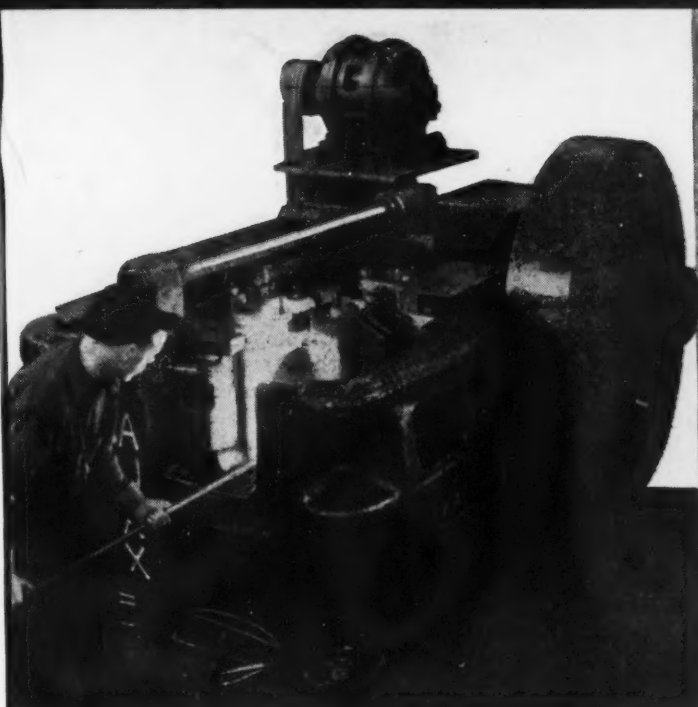
This announcement was made jointly by Cleve H. Pomeroy, president of National Malleable, and Leon Greenberg, managing director, Industrial Steels, Ltd., who has been in Cleveland since last October to negotiate the contracts.

While no estimate was given of the dollar value of the products to be manufactured under the licensing agreement, Mr. Greenberg said that Industrial Steels is already in production on some items and has begun construction of additions to its steel foundries to step up output as rapidly as possible.

Characterizing Australia as "the newest great expanding economy in the world," Mr. Greenberg said that his company also expects to introduce to the Australian motor car industry National Malleable's automotive castings such as it supplies to the American automobile trade. Several of the largest American motor car and truck manufacturers have recently announced plans to produce in Australia, he said, adding that National Malleable engineers plan to design a malleable iron foundry for his company in Sydney.

Australian railways, according to Mr. Greenberg, are a conglomeration of one federal and seven state systems, with four different widths of track which prevent interchange of trains and equipment from one width to another.

A program in which upwards of \$300 million is to be spent for modernizing and unifying the systems has been agreed on by the Commonwealth of Australia Railways, the federal line, and the state systems of New South Wales, Queensland, Victoria, South Australia, West Australia, Tasmania, and Northern Territory.



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Pittsburgh Chamber of Commerce Offers Industrial Peace Plan

Pittsburgh

• • • A blueprint for the preservation of industrial peace has been written for Pittsburgh. Compiled by the Pittsburgh Chamber of Commerce, this 10 point plan has been the subject of consideration of a committee representing the Central Labor Council-AFL and the Steel City Industrial Council-CIO which has been meeting for several months with the Chamber of Commerce to work out a declaration of policy.

The plan needs the approval of both the CIO and the AFL before it can be put into effect, and it has been indicated that the document could become a pattern for a national solution of management-labor ills.

The plan, issued this past week by the Chamber of Commerce, reads:

"The Pittsburgh Chamber of Commerce pledges its cooperation in the promotion of good relationships between Labor and Manage-

Ten-Point Program Sets Forth Basic Responsibilities Of Labor-Management

• • •

ment in this area. The conception of some basic rights and responsibilities of Labor and Management, set forth for discussion with the hope of concurrence, are as follows:

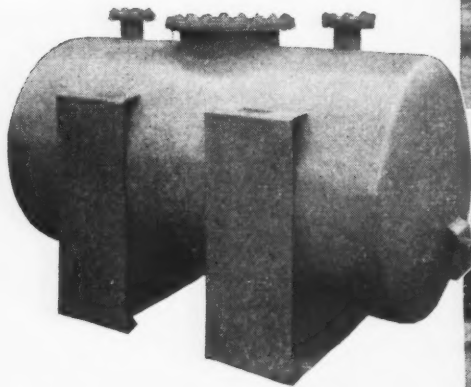
- (1) Workers are free to form and join labor organizations without interference or coercion from any source.
- (2) Workers are free to bargain collectively with any employer through bargaining representatives of their own choice, who will be dealt with in good faith by management.
- (3) Workers and their representatives recognize that the right of collective bargaining imposes the obli-

gation to bargain in good faith and to observe agreements reached.

- (4) Employers, workers and their representatives recognize that an obligation assumed is an obligation to be filled.
- (5) Collective bargaining on wages, hours and working conditions as an instrument of industrial peace is a process by which an employer and the freely chosen representatives of his workers negotiate in the interest of effecting a transaction mutually advantageous to the employer, employees, and customers served by the enterprise of which they are a part. They recognize a mutuality of interest in the success of the enterprise. Successful collective bargaining proceeds with full realization and appreciation of this fact.
- (6) It is realized that increasing shares of wealth are dependent primarily on an increasing total of such wealth and that improving productive efficiency and technological advancement contribute to an expanded product.
- (7) Experience has proved that free men in a free society sparked by a system of free competitive enterprise have advanced living standards beyond the levels in any other nation, under any other system, in any time in the history of the world.
- (8) The right and responsibility of management to manage the operations of an enterprise and direct the working forces subject to the terms of the collective bargaining agreement is an essential to good management. Equally important is recognition that any employee has the right to question management's action when it gives rise to a belief by the employee that his rights have been infringed.

(CONTINUED ON PAGE 144)

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(1) Drop-Bottom Box:

Form No. 72 describes corrugated metal box with hinged bottom for releasing contents on waist-high table to eliminate lost motion of reaching into a tub on production assembling. Free end of bottom is supported by pins which are manually released. Box can be used also for ordinary skid purposes or handling with high lift trucks. *Monroe Auto Equipment Co.*

(2) Metal Fabricating:

Plant facilities for handling production, specialized stamping, forming and assembly work, including heavy weldments, plate fabrication and spot welded assemblies, are presented in folder. Article is included on fabrication of portable steel protective structures for housing equipment in inactivated warships. *Charles T. Brandt, Inc.*

(3) Tool Grinder:

Features and advantages of three-wheel type tool grinder are listed in folder with specifications and illustrations. Three types are available for blocking out, finish grinding and honing of cemented carbides, high speed steels and Stellite. Extra equipment is listed. *Le Matre Tool & Mfg. Co.*

(4) Portable Conveyors:

Pertinent information with sketches and illustrations is presented on wheel conveyors, gravity roller conveyors, stands, portable belt conveyors and dollies. Several types of each are listed in folder and equipment designed for specific requirements can be supplied. *Harry J. Ferguson.*

(5) Welded Design Motor:

Ten per cent lighter in weight and requiring 25 per cent less space than its predecessor, the new Elliot welded all-steel motor announced in bulletin L-12 is available in five frame diameters to cover standard ratings of 150 to 1000 hp and 4 to 14 poles. Directed ventilation and ease of bearing inspection and removal are other features. *Elliot Co.*

(6) Special Purpose Jack:

Bulletin P & P 46 features Simplex Util-A-Tool jack for pulling, pushing, spreading, bending, clamping and lifting operations in mine, railroad, industrial engineering and construction work. Illustrations show various industrial plant uses of tool. Push and pull jacks and steamboat ratchet pulling jacks are included. *Templeton, Kenly & Co.*

(7) Gas Pulsation Dampeners:

Gas pulsation problems and some of the attempts made to correct them are discussed in considerable detail in bulletin PD-1. Information including illustrations,

charts and diagrams is also given on the Fluor pulsation dampener which is described as completely changing a pulsative flow into a steady stream. *Fluor Corp., Ltd.*

(8) Flash Welders:

Specifications, photographs, detailed close-ups and a cutaway sketch of a typical machine are included in booklet No. 204 which describes several models of flash welding machines. Four basic sizes are listed having ratings at 50 pct duty cycle of 20, 50, 100 and 150 kva and upset forces of 2250, 4500, 11,500 and 19,600 lbs respectively. *Progressive Welder Co.*

(9) Liquid Polishing:

How to increase efficiency and effect material savings by using the proper method of spraying liquid polishing and buffing compounds on a revolving wheel are discussed. Factors concerning installation and use of spray equipment are described in booklet as well as method of supplying compound, types of compound available and spraying of satin finish compounds. Equipment and installations are illustrated. *J. J. Stefen Co.*

(10) Wheel Dresser:

Built to eliminate guesswork from wheel dressing, Model B-1 dresser featured in folder is designed for formed wheel dressing accurate to 0.0001 in. Applications are illustrated as are sub-bases available to adapt dresser to practically any grinder using wheels up to and including 14 in. diam. *Vinco Corp.*

(11) Caster Manual:

Information for the prospective caster purchaser on how to select the correct caster is contained in 44-p catalog 65-3. Subjects included are caster construction, molded rubber and Nicro-steel series of caster wheels and recommendations of wheels for industry requirements. Detailed specifications and illustrations with cut-away photographs are included with diagrams and drawings on mounting methods. *Rapids-Standard Co.*

(12) Tube Fittings:

Titled "Prospecting for Perfection," booklet No. W-1108 tells story of the importance of engineering, research and development in the manufacture of tube fittings, flexible hose assemblies and products used in liquefied petroleum gas industry. Many plant operations are illustrated including 18 types of products and a chart showing their use by 15 key industries. *Weatherhead Co.*

(13) Rigidized Metals:

Information on rigidized metals, which include ferrous and nonferrous sheet and strip produced by the Rigid-Tex rolling process, is presented for designers and

manufacturers. Compiled in folder form, comparative data on rigidized and plain metals includes flexural rigidity, impact deformation, buckling and tension figures. Comparisons are illustrated with diagrams. *Rigid-Tex Corp.*

(14) Plant Locations:

Advantages of plant location in Cleveland area are pointed out and backed up with statistics in folder. Factors cited are low cost electric power, strategic location and available labor. Area is said to contain 58 pct of national population, 64 pct of manufactured product classifications, 80 pct of 1945 electric furnace capacity, 41 pct of machine tool products and 73 pct of nation's production. *Cleveland Electric Illuminating Co.*

(15) Marking Tools:

Utility marking outfit with interchangeable type for metal marking is described and illustrated in bulletin. How nine sizes of type can be used in a single holder is illustrated. Charts show the sizes of holders and type available, the number of characters that can be marked with various size holders and contents of complete fonts of type. *M. E. Cunningham Co.*

(16) Hydrocarbon Analysis:

A discussion of adsorption fractionation and the fractionator specifically designed for light hydrocarbon analysis is contained in bulletin No. 105. The adsorption fractionator is a self-contained unit which separates, identifies, measures and collects the components of light hydrocarbon gas mixtures and records the analytical data. *Burrell Technical Supply Co.*

(17) Safety Brakes:

Industrial safety brakes which operate on ordinary factory air line pressure with a braking capacity equal to conventional brakes requiring ten times the operating pressure are featured in bulletin No. 460. Diagrammatic sketches are included. *Linderman Devices, Inc.*

(18) Electric Melting Furnaces:

Revised booklet depicts latest developments in the construction and operation of the Heroult electric furnace. Evolution of electric furnace design from 1906 to the present time is reviewed with several illustrations of modern installations. Table on furnace types, sizes, capacities and transformer ratings is included. *American Bridge Co.*

(19) Induction Motors:

Publication No. 133, a die cut folder, shows cutaway views and details of E-M heavy duty squirrel cage induction motors designed for drip and splash proof operation. Power ratings are from 100 to 1000 hp, 1800 rpm and lower. *Electric Machinery Mfg. Co.*

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(20) Surface Broaching:

New colored sound film on surface broaching is said to give a graphic demonstration of how effectively surface broaching is accelerating production of a wide range of products including locomotive frame ends, flat iron bases, automobile bearings, wrenches, pliers and automobile cylinder blocks. Film is 16 mm and runs about 18 minutes. *Lapointe Machine Tool Co.*

(21) High Strength Steel:

Complete data on properties, fabrication and application of Cor-Ten are presented in 68-p catalog. First section discusses properties, including high resistance to atmospheric corrosion and outlines utilization to best advantage. Second section gives full data on fabrication by standard practices including welding procedure. *Carnegie-Illinois Steel Corp.*

(22) Stud Welding:

Compiled to provide factual information on the use of automatic stud welding, processes, equipment and studs are covered in catalog 47A. Information on designing for stud welding is included together with specifications and physical properties data on Nelson flux-filled studs. A section is devoted to stud welding applications. *Nelson Sales Corp.*

(23) Degreasers:

Principle and design of D'Oiler vapor degreasers are outlined in folder. Several types including laboratory, two-dip, three-dip, vapor spray, barrel type, automatic and semi-automatic and special large models are illustrated. Steam, electric and gas heated units are available and a line of solvents developed to provide a stabilizing inhibitor without diminishing solvent efficiency are listed. *Mechanical Process Co.*

(24) Cylindrical Grinders:

Features of the 4, 6, 10, 14 and 18-in. type C Norton grinders are described in folder with illustrations of each unit. Four inch model is designed for turning out small cylindrical work in diameters up to 2 in. while large 18-in. model supplied with either hydraulic or mechanical traverse table is recommended for such work as large shafts, machine spindles, boring bars, etc. *Norton Co.*

(25) Metal Marking:

Announced as the most complete text produced in the metal marking industry, catalog No. 47 has been compiled to serve as a guide to engineers, designers and officials concerned with production of metal products. Production marking machines, precision graduating equipment, marking dies and fixtures and numbering heads are described and illustrated. *Noble & Westbrook Mfg. Co.*

(26) Zinc Coatings:

Characteristics and properties of Zincalite protective metal coating applied by brush, spray gun or dipping are presented. Zincalite, said to be a hard, durable coating with galvanic protective power which is not destructive to zinc, prevents the atmosphere from destroying zinc and protects the base metal. *Industrial Metal Protectors, Inc.*

(27) Truck-Tractors:

Complete line of gas and battery powered material handling machines are presented in catalog. In addition to specifications and illustrations on previous models of fork lift trucks and towing tractors, a new series of pneumatic-tired fork lift trucks is included as well as a wide variety of handling attachments. *Clark Tractor Div.*

(28) Rail Supplies:

Rollers, puller-jacks, box car door pullers, track braces and gear and wheel pullers are included in this pamphlet. Applications of such products, particularly where plant car handling and in-pant rail facilities are concerned, are shown. Typical of items featured is a box door puller that can be handled by one man when opening or closing box car doors from ground or shipping platform. *Edwards Mfg. Co.*

(29) Arc Welding Electrodes:

Covering the company's entire line of alloy arc welding electrodes, 40-p bulletin No. 48-RS includes complete technical data on a variety of subjects such as welding procedure, physical properties, metallurgy and deposit characteristics. Text material is supplemented with illustrations of welding operations and close-ups of welds. *Alloy Rods Co.*

(30) Machine Tool Parts:

Standard replacement parts including collets, pushers, cams and gears available in all types and sizes for all screw machines, lathes and milling machines are listed in catalog 47 with details. A section is devoted to the company's screw machine rebuilding service. *Modern Collet & Machine Co.*

(31) Drilling and Tapping:

Models 125-U, 125-H and 125-HR Kaulauna portable horizontal drilling and tapping machines and No. 700 index table are pictured in catalog with design drawings and specifications. Machine design is based on premise that many drilling and tapping operations can be performed best with horizontal machines. *Kaulauna Machine Corp.*

(32) Carbon and Graphite:

A 160-p handbook describes various uses of carbon and graphite and the physical, chemical and structural properties of products made from these materials. A variety of general information particularly useful to shop production supervisory personnel is included. Electrode carrying capacities, carbon welding rods, electrical brushes, furnace electrodes and graphite molds are described. *International Graphite & Electrode Corp.*

(33) Synchronous Starters:

Synchronous motor starters for 600-v or less and for 2300 to 4600-v service are covered in series of four bulletins. Starters are push button magnetic type, using auto-transformer mechanisms for reduced voltage starting requirements and heavy duty contactors for across the line starting. Automatic field application is obtained by the polarized field frequency relay system of control. *Electric Controller & Mfg. Co.*

(34) Ball Bearings:

Bulletin A-120 on SC line of ball bearings gives engineering information covering pillow blocks, hanger bearings, flanged units, take-up units, cylindrical units and steel frame ball bearing take-ups. Selection tables provide means of choosing correct bearing for any application within size and load range of line. *Dodge Mfg. Corp.*

(35) Stainless Steel:

Data for engineers and production men has been made available in folder form on available types of Resistal stainless steel. Type analyses, physical properties, electrical properties, heat treatment, average mechanical properties, heat resistance, hardness and data on working is included. *Crucible Steel Co. of America.*

(36) Punch Press Feeds:

Littell line of automatic feeds for punch presses is listed in catalog No. 47. Roll feeds, straightening machines, hopper feeds, reels, feeding machines, rollers, air accessories and dial feeds are included with diagrammatic sketches, illustrations, descriptive information and specifications. Outlines of suggested letters of inquiry on information needed for quotations on each type follows index page. *F. J. Littell Machine Co.*

(37) Pyrometers:

Two bulletins are available on the Alnor line of pyrocons and pyrometers. The pyrocon, a contact pyrometer for measuring surface temperatures, is pictured in bulletin No. 4257, checking brake drum, box board, rubber, steam trap, heat-sealing machine and die temperatures. Pyrometers covered in bulletin No. 4361 are designed to withstand severe service conditions. *Illinois Testing Laboratories, Inc.*

(38) Arc Welder:

Hobart multi-range arc welder with dual and remote control is subject of folder No. 8731. Over 1000 combinations of amperage and voltage with multi-range control are available to make possible exact welding heat for the job. Remote control feature allows operator to make current corrections and adjustments at the work, regardless of distance from machine. *Hobart Bros. Co.*

(39) Lock Washers:

The how, why and where of spring lock washers is presented in folder form for purchasing agents, design engineers and production men. Answers are given to questions such as what is the primary and secondary zones of power in a fastening device, when should a spring lock washer be used, and when should a lock nut be used with a spring lock washer. *George H. Garrett Co., Inc.*

(40) Bearings and Bushings:

Added to the Johnson line in the current 80-p catalog, No. 460, are new sizes of plain bearings, electric motor bearings and bronze bars. Data and illustrations on graphite, self-oiling and oil grooving bearings is followed by information on babbit bearing metal and bronze bar stock. Index lists electric bearings alphabetically under make of motor. *Johnson Bronze Co.*

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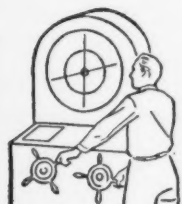
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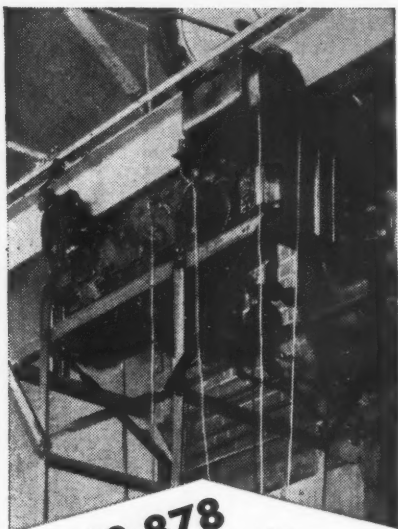
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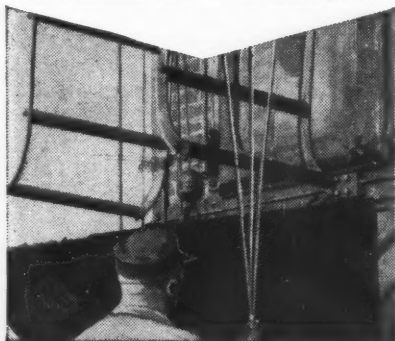
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(CONTINUED FROM PAGE 140)

- (9) Industrial peace is not fostered by labor unions' attempts to disrupt management by organization of management forces, indulgence in jurisdictional or inter-union conflict which penalizes employers, or other actions which involve violence or disregard for personal or property rights.
- (10) Collective bargaining thrives best in an atmosphere in which those on each side of the bargaining table have confidence in the integrity and honest purpose of each other. Barriers to successful collective bargaining fall when mutual recognition of responsibilities and equality of rights and treatment under law is present.

This statement has been approved by the Chamber of Commerce and is now awaiting the

approval of the two labor organizations. Members of this joint labor-management committee are as follows: Alex W. Dann, chairman; Thomas Fitzgerald, Donald D. Munroe, John Lester Perry, Theodore F. Smith, Thomas F. Troy, William B. McFall and James H. Greene, ex-officio for the Chamber of Commerce; Hunter Wharton, secretary, Building Trades Council; John Dorsey, president, Central Labor Bureau; Charles Levy, international representative of the Building Service Employees, and Robert Lieberman, business agent, Retail Clerks' International Protective Assn., for A. F. of L.; Anthony Federoff, CIO regional director; Thomas Murray, representative, United Steel Workers of America; Joseph Goney, director of district 17, United Steel Workers of America; Milton Weisburg, representative of the Retail, Wholesale and Department Store Employees Union, for CIO.

Reynolds Earnings Of \$4.94 a Share Set New Peak Record for Firm

Richmond, Va.

• • • Reynolds Metals Co. and its wholly owned subsidiaries earned \$4.94 per share of common stock, after provision for dividends on preferred stock, in 1946 as against \$4.03 per share in 1945. R. S. Reynolds, president, announced in the company's annual report to stockholders. The \$4.94 per share is the highest rate of earnings in the company's history.

Net profits after taxes were \$5,336,507 in 1946 as against \$4,396,187 in 1945. Net profits before taxes were \$9,942,169 in 1946 as against \$8,364,487 in the previous year.

The company's surplus at the end of 1946, Mr. Reynolds reported, stood at \$28,379,640 as against \$22,099,059 at the end of 1945. Total assets of the company, he stated, stood at \$131,272,848 at the close of 1946 as again contrasted with a \$85,991,227 total at the end of 1945.

"Primary aluminum capacity was increased from 165 million lb in 1945 to 380 million lb in 1946, an increase of more than 130 pct. Rolling capacity was increased ap-

proximately 350 pct. This increase was made possible mainly by acquiring (through lease or purchase) and rehabilitating idle government owned war plants reported to have cost approximately \$210 million," Mr. Reynolds said.

"Sales volume in January and February 1947 totaled more than \$30 million as contrasted with approximately \$11 million in the same period of 1946, and substantial operating profits were realized in this period.

"Tests conducted in collaboration with the food industry have demonstrated that a new Reynolds all-aluminum foil package allows food to be frozen in one-half to one-third of the time required for conventional packages. More than a year of research and development work has resulted in the construction of packaging machines to form and close these containers automatically. After a year of testing, foil butter wraps are now being distributed for the first time. Practical tests establish that the new package will keep butter dairy-fresh twice as long as any material previously used. Household foil is being placed on the market in rolls for use by the housewife in protecting and preserving food. Foil insulation for all kinds of building is being marketed in large quantities.

AFA Convention

(CONTINUED FROM PAGE 47)

and A. R. Elsea, Battelle Memorial Institute, Columbus; "Segregation in Small Steel Castings," by H. F. Bishop and K. E. Fritz, Naval Research Lab., Washington.

Job Evaluation and Time Study Session

"Establishment and Use of Standard Data," by M. Annich, American Brake Shoe Co., Mahwah, N. J.

12:00 P.M.

Steel Round Table Luncheon

Presiding—F. A. Melmoth, Glen Lake, Cedar, Mich.

Co-Chairman—John H. Hall, Swarthmore, Pa.

Pattern Round Table Luncheon

Subject—"Need for Close Relationship Among Patternmakers and Foundrymen." Discussion Leader—A. F. Pfeiffer, Allis-Chalmers Mfg. Co., Milwaukee.

2:00 P.M.

Foundry Cost Session

"Two Ways to Make Profit," by W. E. George, Booz, Allen & Hamilton, Chicago; "Foundry Costs and Cost Controls," by C. E. Westover, Westover Engineers, Milwaukee.

Gray Iron Session

"Effects on Gray Iron of Minor Constituents Derived from the Additions of Copper Alloys," by K. E. Rose and C. H. Lorig, Battelle Memorial Institute, Columbus; "Isothermal Transformation of Molybdenum Cast Iron," by C. A. Nagler, Wayne University, Detroit, and R. L. Dowdell, University of Minnesota, Minneapolis; "Reduction in Chilling Tendency Through Silicon Carbide Inoculation of Gray Cast Iron"—E. A. Loria, A. P. Thompson, Mellon Institute, Pittsburgh, and H. D. Shepard, Kerchner, Marshall & Co., Pittsburgh.

Gray Iron Shop Course (4)

Subject—"Variables Affecting Electric Furnace Gray Iron." Discussion Leader—K. H. Priestley, Vassar Electroloy Products Inc., Vassar, Mich.

Sand Session

"Density of Molding Sands," by H.

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to meet *all* requirements for such a cleaner—as determined by the experience of Wyandotte Service Engineers.



Unretouched photograph showing the comparative stability of Emlon (1, 2 and 3) and a leading competitive product (4, 5 and 6)

Above you see the following 5% emulsions, after standing for 24 hours:

(1) Emlon in tap water; (2) Emlon with 2.5% of sulfuric acid added; (3) Emlon with 2.5% of caustic soda added; (4) Competitive product in tap water; (5) Competitive product with 2.5% of sulfuric acid added; (6) Competitive product with 2.5% of caustic soda added. Note separation, or breakdown, of 4, 5 and 6.

This illustrates the unusual *stability* of emulsions formed with Emlon. This stability results in better and faster cleaning action, longer cleaning solution life and low cleaning costs.

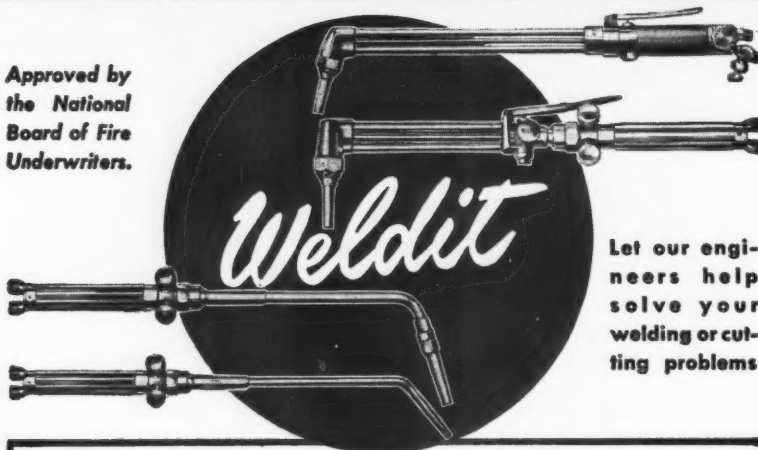
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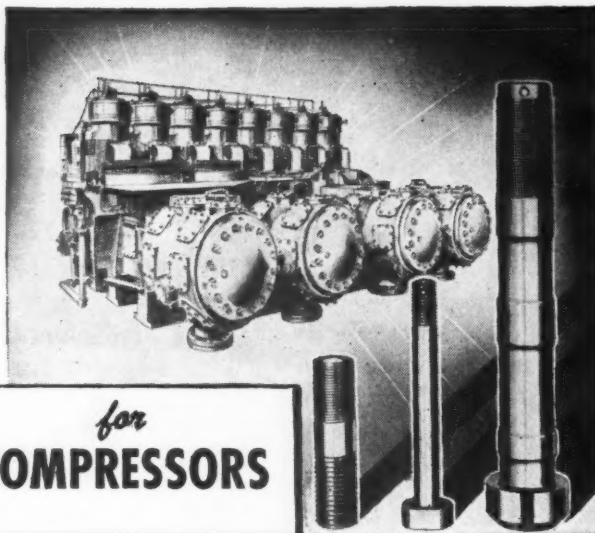
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NEWS OF INDUSTRY

W. Dietert, H. H. Fairfield and E. J. Hasty, H. W. Dietert Co., Detroit; "Physical Properties of Molding Sands," by G. R. Gardner, Aluminum Co. of America, Cleveland.

4:00 P.M.

Steel Session

"Determination of Molten Metal Temperatures," by G. Vennerholm and L. C. Tate, Ford Motor Co., Dearborn, Mich.; "Temperature Distribution in Metal Molds," by M. C. Udy and H. O. McIntire, Battelle Memorial Institute, Columbus.

Sand Shop Course (4) (Gray Iron)

Subject — "Variables in Gray Iron Sand Practice." Discussion Leader — C. B. Schofield, Chevrolet Gray Iron Foundry, General Motors Corp., Saginaw, Mich.

Job Evaluation and Time Study Session

"Establishment and Use of Standard Data" (II), by M. Annich, American Brake Shoe Co., Mahwah, N. J.

7:00 P.M.

Annual Banquet

Subject—"Tradition—An Asset or a Liability." Speaker — Arthur H. Motley, president, Parade Publication, Inc., New York.

Surplus Sale to Offer Heat-Treating Furnaces

Washington

• • • Nearly 10,000 surplus heat-treating furnaces and ovens, built by the government for war purposes at costs of \$500 to \$250,000 each, soon will be offered for sale by WAA at fixed prices ranging from 36 pct to 75 pct of acquisition costs.

It was said that the \$35 million offering will include foundation and portable type furnaces for heat-treating metals and heating and reheating specialties as well as ovens for enameling, japanning and lacquering.

Low prices have been set to allow purchasers to modify or rebuild the equipment for specific purposes. Those furnaces and ovens which are badly rusted or in need of major overhauling will be offered on a competitive bid basis.

See Southwest Empire Following WAA Mine, Blast Furnace Sale

Washington

• • • Disposal by sale and lease of government-owned coal, iron and steel facilities in Texas, Oklahoma and Colorado after a series of negotiations between WAA and private operators is viewed in some quarters as providing a base for founding an industrial empire in the southwestern area and providing increased production in the Rocky Mountain area.

Three transactions are involved. WAA has leased to the Lone Star Steel Co. the coke ovens and blast furnaces plant at Daingerfield, Tex., the McCurtain and McAlester coking coal mines in Oklahoma, and the East Texas iron ore beds; it also has leased to Sheffield Steel Corp. the blast furnace and by-product coke plant at Houston and the North and South Basin iron ore beds at Linden and Jacksonville, Tex.; and finally, WAA has sold to Colorado Fuel & Iron Corp. the steam generating plant and unused coke ovens within CF&I property at Pueblo.

Combined capacity of the three properties is estimated at 676,000 tons of pig iron and 976,000 tons of coke annually.

The Lone Star facilities which include a blast furnace, a battery of 78 coke ovens and auxiliary facilities were leased for a period of up to 5 years with an option to buy the \$30 million property for a price of \$7.5 million within the first 2 years of the lease upon a down payment of \$1 million. An overall rental to the government of \$3 per ton of pig iron produced is provided under the terms of the lease.

A further condition of the lease is that Lone Star must provide certain service for the Navy which has proving grounds located on the property; also, the Lone Star company has agreed to provide certain tonnages of coking coal and iron ore to Sheffield for its Houston blast furnace should need arise.

Production capacity of the Daingerfield property is rated at 400,000 tons of pig iron and 375,000 tons of coke annually. The coke ovens have been maintained at standby temperatures and production of coke is expected to



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This map is of direct interest to firms contemplating the manufacture of their products in Canada. It illustrates the nation-wide facilities of the Dominion's oldest steel fabricators which are staffed and equipped to serve almost every phase of heavy industry. There are two distinct ways in which we can serve you:

1 If you are intending to build your own factory, we can:

A Design, fabricate and erect the steel framework of your factory and manufacture all necessary tanks, pressure vessels and other platework.

B Manufacture and erect cranes or other handling equipment.

C Manufacture and install your boiler plant.

D Supply your requirements for warehouse steel.

2 If you do not intend to build your own factory:

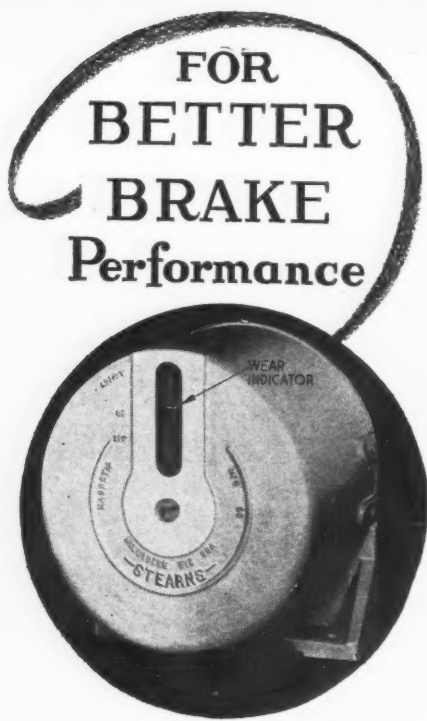
If your product involves steel fabrication, machine shop work and assembly, we can in many cases undertake the whole manufacture in our own shops, thus relieving you of considerable capital expenditure.

We have a broad experience in the production of equipment to our customers' designs or to designs developed by us to meet their requirements.



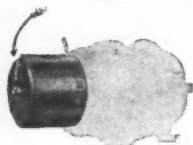
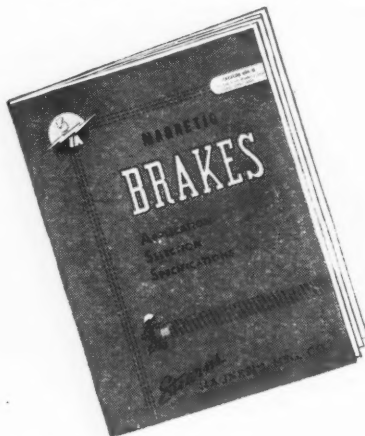
Write for illustrated booklet 1A "Builders in Steel", describing the Dominion Bridge organization. Address enquiries to P.O. Box 280, Montreal, Canada.

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NEWS OF INDUSTRY

Plant School

Washington

• • • Plans by Syracuse (N.Y.) University to convert a wartime machine tool factory into a vocational training school in connection with its engineering course have been revealed with the purchase of the Lipe Rollway Corp. plant from WAA for \$214,500. Acquisition of the six-story steel and concrete building will enable the university to institute technical courses between the secondary curriculum and the regular engineering course, officials said, and permit emphasis to be placed on practical phases of engineering.

start within 10 days to 2 weeks. Eventual installation of steel-making facilities is also contemplated.

Markets in the immediate area will be given preference, according to Dr. George H. Anderson, vice-president of the Lone Star Steel Co. He added that the sales and distribution of Daingerfield products would be handled by the Brumley-Donaldson Co. with offices in San Francisco, Los Angeles and Seattle. It is reported that the distributor plans to open a branch office in Dallas.

It has also been announced that George D. Ramsey would be named vice-president and general manager in charge of the Daingerfield operations.

The Houston and the Basin facilities, valued at \$18 million, were leased to Sheffield for a period of 3 years with an option to buy for \$7.5 million at any time within 2 years upon down payment of \$1 million with the balance payable in ten annual installments.

The firm was also given the right to negotiate for an 18-year extension of the lease before its termination or cancellation. The blast furnace has a rated capacity of 276,000 tons of pig iron per year while the coke plant output is estimated at 276,000 tons annually.

New coke production is provided by the sale of facilities at Pueblo to CFI. Though fully completed and located within the CFI plant, the 74 Koppers Becker type ovens have never been in operation. The firm has announced plans to place them into production at the earliest possible date. Rated capacity is 325,000 tons of coke annually.

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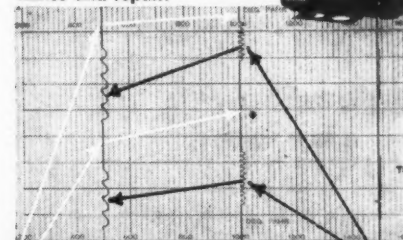
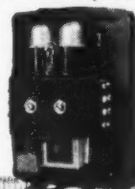
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Gas Shortage Layoffs Increase Unemployment In Pittsburgh District

Pittsburgh

• • • Employment in the Pittsburgh district during February and March 1947 was marked by temporary and sporadic layoffs. There were 30,000 new or re-opened claims out of 170,000 total claims processed in February for unemployment benefits by the District Pennsylvania State Employment Service offices. The bulk of these claims were the result of the layoffs caused by the gas shortage in industrial plants.

Peak unemployment was reached in the week ending Mar. 6, when 50,689 claims were filed in one week. Unemployment has declined since Mar. 6, however, but as late as the last week in March the gas shortage was still preventing many workers from returning to their jobs and slowing down the employment of new workers.

Geographically, the unemployment problem in this area is estimated as follows: Pittsburgh, 18,900 male and 3400 female; Braddock, 3200 male and 1000 female; Carnegie, 1470 male and 130 female; McKeesport, 3600 male and 1200 female; Ambridge, 1084 male and 800 female; and New Kensington, 2400 male and 1000 female.

According to the files of the Pennsylvania State Employment Service office at Pittsburgh, the iron and steel industry in the area offers employment opportunities in the following groups: Industrial, clerical, administrative and professional personnel, including mechanics, metallurgists, accountants, and mechanical, industrial, civil, electrical and chemical engineers. Almost all maintain full-time legal and medical staffs. Likewise, librarians, personnel officers, labor relations specialists and social workers are needed by the companies.

The heavy machinery industry, including particularly the electrical machinery group, employs a large part of the area labor force. Occupational opportunities nearly cover the entire scientific, professional, clerical and industrial occupation classifications. Scientific

If you have a SPECIAL PROBLEM

in any of these operations, where precision work is demanded and where greater production at man-hour savings is paramount—

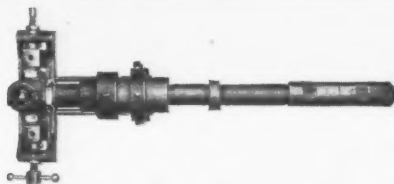
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OIL BURNER assures

**HIGH FUEL CAPACITY . . . thus
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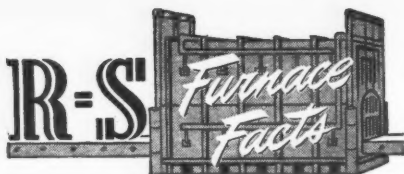
Type "SAL" Steam Atomizing Oil Burner is a large capacity burner with great flexibility of performance throughout a wide operating range. Because of thorough atomization it produces a clean, steady, well-defined flame, which completely burns the fuel oil. It reduces the tendency to smoke, form soot or incur carbon losses. Type "SAL" Oil Burners are adaptable to dual fuel systems on large boilers. They can also be used with comparable convenience and economy in pulverized coal registers, open hearth furnaces, rotary cement burning kilns, large dryers and many other furnaces. It is frequently used to fire fuel oil above existing coal stokers. For detailed information, write for Bulletin 24.



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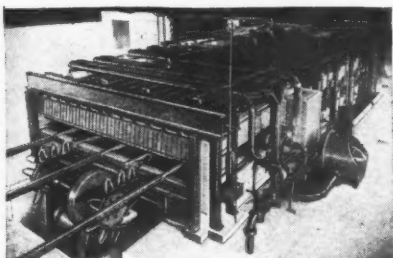
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New Furnace for Glamorgan Pipe & Foundry Company

A modern R-S continuous cast-iron pipe annealing furnace of the type shown is now under construction for Glamorgan at Lynchburg, the oldest cast iron pipe foundry in America. Pictured is discharge end showing control valves, Spencer Blower, and alloy fingers on conveyor. The unit shown is gas fired, and has a capacity of 30 to 120 pipe per hour, or 25 tons. The furnace is 22 feet wide and handles 20-foot lengths.



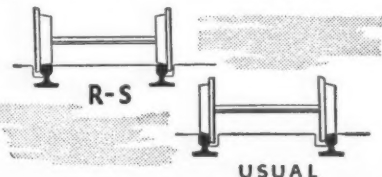
Similar furnaces are in use at U. S. Pipe Co. plants in Alabama and New Jersey; National Pipe Co. in Birmingham, James Clow Company, in Coshoc-ton, Ohio, and the Lynchburg Foundry Company in Radford, Virginia.

A heater who lived in Duluth
Said maintenance charges, forsooth!
As high as they are
Demand we use R-
S Furnaces. Ain't it the truth?

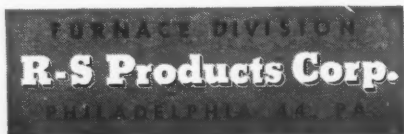
In the Steel Industry, 8.2c per
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P-D1

No Binding of Wheels with R-S Car Hearth design. The conventional type of support with wheel flanges inside the rails sometimes leads to binding when thermal expansion causes the hearth to spread and widen the wheel-gage.



R-S car-hearth wheels have their flanges outside so that wheels function easily regardless of thermal expansion.



NEWS OF INDUSTRY

and technical occupations find many job openings, including such specific positions as pharmacists, chemists, dietitians, architects, engineers, draftsmen.

Clerical and office help in short supply include stenographers, typists, bookkeepers, cashiers, and comptometer and other machine operators. Industrial occupations in need of workers include machinists, cabinetmakers, copper-smiths, machine shop operators, molders, structural layout men and patternmakers.

Koppers Gets Extension Of Lease to Operate Two Pig Iron Furnaces

Washington

• • • Continued production by two pig iron furnaces at Granite City, Ill., has been assured with the announcement by WAA that the interim lease under which the Koppers Co. has been operating them has been extended until June 1948, providing a suitable bid to purchase has not been received and approved before that date. They are rated at 465,000 tons of pig iron annually.

The plant has been advertised for sale but no bids were received in the time limit set by WAA.

Nevertheless, not only because of the pig iron shortage but the fact that the Granite City furnaces supply numerous small fabricators in that region, the Koppers Co. was persuaded to agree to carry on operations until next year or until other disposal arrangements were made.

Under the present arrangement, it was agreed that upon termination of the leasing arrangement WAA will pay Koppers in full for whatever raw materials and finished materials inventory, operating supplies and equipment remain on the premises at such time.

Approximately \$8.7 million has been invested in the property by the government. It includes two blast furnaces—one erected in 1921 and the other in 1926—both of which were down from 1932 until defense mobilization in 1941. There are 28 structures on the property and in addition to the pig iron, plant output is rated at 435,000 tons of coke and byproducts annually.

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No Permit Necessary On Goods Exported To Sweden before Mar. 20

Washington

• • • Goods exported to Sweden which were enroute from the United States before Mar. 20 and which were not previously subject to important licenses, may enter Sweden without an import permit, the OIT has been advised by the American Legation at Stockholm in an interpretation of Swedish action of Mar. 15 reimposing controls over most commodities.

With certain exceptions, all import licenses issued by the Swedish State Trade Commission prior to Mar. 15 are valid until June 30. Goods for which irrevocable letters of credit have been issued may be exported to that country during the valid period of the letter of credit.

Certain commodities on the special free list are exempted from export control and additional items have been placed on this list. These include vital raw materials, machinery and parts designed to increase Swedish production. Among the more important items added are:

Railway vehicles and materials including electric locomotives; farm and industrial machinery including lathes, drilling, pressing, punching, riveting machines; rolling mills and steam, pneumatic, spring and drop hammer mills; steam engines and turbines; electrical equipment including switches, plugs, sockets, telegraph and telephone apparatus.

Also, base metals including brass, copper and aluminum; minerals including asbestos, bauxite, cryolite quartz, magnesite, and mica and its manufactures; wrought iron blooms, ingot metal billets; unworked malleable castings; nonmalleable cast items; unworked nickel, magnesium, cobalt, cadmium and alloys of copper, tin, lead, zinc and nickel; malleable iron scrap; and granulated pig iron, steel grit and iron filings.

A translation of the Swedish tariff showing all commodities on the free list is available in the European Div., Dept. of Commerce, Office of International Trade, Washington, D. C.

A FORTUNE IN PATTERNS



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Here are also patterns for **Strenes Metal**

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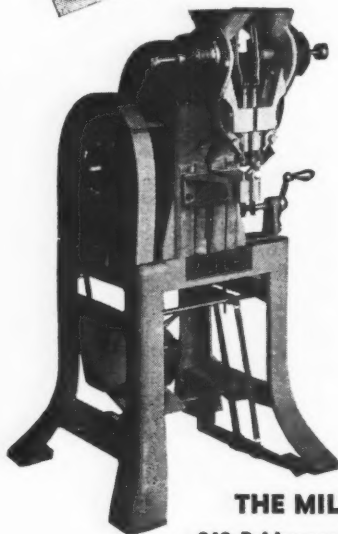


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NEWS OF INDUSTRY

Foremen's Clubs Meet In Philadelphia May 2-3

Philadelphia

• • • Delegates from Foremen's Clubs throughout the country meeting in Philadelphia to discuss labor-management relations at a national conference on May 2 and 3 will be addressed by Dr. George W. Taylor, Professor of Industry at the University of Pennsylvania and former chairman of the War Labor Board, it is announced by Harry Verdier, executive secretary of the Philadelphia Foremen's Club, who is serving as conference chairman.

Mr. Verdier revealed that more than 400 delegates from groups over the entire country are expected to attend.

Mayor Bernard Samuel will welcome this National Conference of Foremen's Clubs at the opening of the two-day session to be held in the Adelphia Hotel.

Conference members will also be addressed by Robert M. Creaghead, management consultant of Cleveland; Sterling W. Mudge, supervisor of training at Socony-Vacuum Oil Co., New York, and C. Arthur DuBois, director of training for the Scoville Mfg. Co., Waterbury, Conn.

Cancels War Exemptions Under Walsh-Healy Act

Washington

• • • Effective immediately, a Labor Dept. order has abolished virtually all the special Walsh-Healy Act exemptions which were granted during the war in order to speed production and availability of various materials.

The Act requires that government contracts in the amounts of \$10,000 or more to be let only to regular dealers or manufacturers who have met specified labor standards as to minimum wages, employment or convict or child labor, health and safety standards and others. State prisons alone supplied the government with \$60 million worth of supplies during the time the restriction was lifted.

Specifically affected by the revocation order were contracts let to Defense Production Associations, states and territories, and purchases from foreign countries.